# The Review of Metaphysics

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# FACT AND DESTINY (II) *

## Argument of the First Five Lectures

The problem of these lectures may be thus resumed: whether our thinking is adequate or can be adequate to that aspect of the world which we call the factual, the particular, the contingent.

Thought is occupied as a rule with a stuff which is not thought. What could thinking mean without a topic, a grist as from outside ordinarily supplied by the senses? As cognitive beings we can have no quarrel with the supply — we accept; as practical beings we never simply accept. The gibe of Marx, that philosophy reflects on the world whereas the task is to change it, does but describe the daily program of everyman. Only, to alter fact is not to escape fact. The degree to which fact is alterable, and by us, is itself a fact. Our problem is this unremoved enveloping factuality, the cosmic web into which all our struggling, shattering, reshaping more deeply enmesh us. What if anything our philosophies do with fact is today the chief test of their grasp of their proper business.

Modernity, so bold in its outreach for practical control, has been increasingly meek toward this issue: its flag has become "Deference to Experience," as if experience were a gift-package — 'datum' is the word — arriving with the label "To be received without protest or enquiry — no looking in

* An outline of the Gifford Lectures, first series, given at Glasgow, 1938-39. The Program of the lectures appeared in this *Review* for September, 1950 (Vol. IV, No. 1).

the mouth." Some protests we do indeed hear, and there are brash souls who enquire "Why these facts and not others?" But typical sagacious modernity is wise-dog-mindful-of-his-bacon; it is first of all 'empirical,' it will master Nature, but by way of perfecting its obedience. No one can doubt the tactical and also moral sense of this policy; yet I challenge the total capitulation that has gone with it. The strange antithesis between our proud engineering projects reaching beyond the skies and the pseudo-virtuous desertion of man's will to understand I must consider a liability of our great epoch.

I propose accordingly to begin by meditating on the talismanic term, 'experience.'

## Lecture I: Experience and Ideas

The word 'experience' names today a court of appeal for thinkers of all schools. This is as much as to say that it has become ambiguous. It is presumed to indicate an available and secure point of beginning for all knowledge. But what and where is that point?

The same scrupulous care for well-founded thinking which has so commended experience has obliged us to distinguish between 'pure experience' and run-of-the-mill experience, adulterated as it is with assumptions and interpretations — in short with thought. But the quest for certitude in pure experience was bound to end as it has ended — in a blank. For how can we reach thought-proof certitude without reaching at the same moment inanity? A sad triumph, is it not, to close in on the great prize of certitude and to bag only an atom of immediacy, a mere *click* which dares not mean anything because a meaning is a thought?

Those who have sought this result have been driven by a prior conviction that the intrusion of thought must be equivalent to risk. But have the seekers of certitude any right to prior certitudes? And if not, may we not risk doubting their assumption? I shall venture to describe experience without this prior suspicion of thought, subject to the corrections of further thinking.

I propose that we consider all experience as experience *by* a self, a 'subject,' and as experience *of* a not-self, an 'object.'

The first of these steps taken alone brings us to the Cartesian level of sophistication with whatever perils attend it. One such peril is that of lending to all experience a subjective cast: we are sure of the I-think which attends every content; we are not sure of any content. This can hardly be the character of experience which commends it to scientific notice, inasmuch as science is concerned with the content.

But taking the second step with the first — all experience is of a not-self — we break out of the egocentric enclosure and escape the subjective bias without repudiating the self-subject who seems to be always discoverable. Of this not-self we have to note that with all its variety and fluidity it has a certain continuity. Objects and events which are 'there' share an identical there-ness: there is a common environment having a persistent character of its own, which answers rather precisely to the degree of identity maintained by the self. For simplicity, and without doctrinaire implications, let us say that experience is of 'a world' : it is a special sort of *meeting between a self and a world*. With this rough scaffolding we are able to ward off several prevalent misconceptions of the nature of experience. Consider three of them.

The word 'experience' suggests passivity, as if our experience were something that happens to us. And indeed this is half-way the case: if we were able to anticipate or control the detail of each incoming moment, experience would not be what it is, the incessant arrival of the unexpected, a continuous course of instruction, and in its sum the unrolling of an unknown destiny. Yet if we were to describe a football game as something that happens to the players, we should omit at least half of the experience. Experience includes experiencing; and experiencing is an activity detailed at its maximum quiescence, in acts of attention.

The word 'experience' suggests a kind of knowing, an interest in what is there, a yield of fact. What it fails to suggest is that, life being profoundly emotional, every item of experience is charged with feeling. There is a constant undercurrent of feeling about the very act of experiencing, a concern not free from anxiety about what is involved in being alive in this particular world. The power of this feeling is concealed by

its constancy, except when some stirring or hope or fear sends a shaft into its depths; yet the level of life for every conscious creature is measured by the depth of its concern for the experiencing process. At the human level, the latent tension of feeling with which the world is met attains the point of passion.

The word 'experience' fails to suggest any variable in the efficiency of our experiencing. The content of experience is subject to judgment at every point as better or worse; but can our activity of experiencing be better or worse? At the human level, this becomes a crucial issue, subconsciously operative. The self is self-critical; and with the question "How can the world be bettered?" goes the other question "How can I better meet the world?"

These observations enable us to enlarge our notion of experience to an extent likely (and intended) to bring consternation to any who regard it as a primitive term: in experience, we venture to say, a self is meeting its world always receptively, but also actively, passionately, and more or less well. We are now prepared to put the question, How can experiencing be better or worse done?

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There are several variables in the effectiveness of our attentive adjustment to the world in experience; but for the present we are concerned with only one of them, our *equipment of ideas*. This equipment is more or less adequate. It varies greatly from infancy to maturity, and also from man to man. Our educators appear to be occupied in trying to make it perfect, — they would 'prepare us for life' — in which effort they never succeed. But before and underneath their work, every moment of experience, while meeting its own occasion with the existing equipment, is adding to its equipment for meeting the next occasion! Thus every moment of experiencing has a double responsibility: it has to meet the world of the given moment as well as possible, and it must add to its equipment of ideas for the next moment. This two-fold process is itself an intimation that the equipment is never adequate: its operation is always at the same time its growth. (It will be

noted that the 'idea', as an item of equipment, is not an object *of* which we think, but a conception *with* which we think.)

It is a mark of the human species to realize that its ideas are not adequate, and to take explicit steps to improve the equipment. There are three respects in which this inadequacy is currently — I might almost say spontaneously — felt:

First, we know that we do not know what is going to happen. And for the broad inclusions of "whatever may happen," we are less than fully prepared. Toward the unknown future we have specific emotional attitudes ranging from hope to dread, strung on the categories of 'the possible,' 'the probable,' etc. If we could conceive a totally predictable future, these emotions, having no work to do, would dissolve into sets for action; so long as the skein of futurity eludes us, they remain. (Who would give up these emotions for the charm of total-prophecy?)

Second, in regard to present fact, ideas show a constitutional feebleness. Our perceptions take hold of the superficial detail of things and events, but our concepts grasp only an 'essence' which we ourselves distinguish from the reality. They fit loosely over the particular occasion: our best advice falls short of suiting the individual predicament; our words of comfort leave an afterklang of abstraction — they are inadequate because our thoughts are inadequate.

Third, ideas are members of an ordered system, whereas facts are inherently irregular. Within facts, law can indeed be discerned, but always as describing the passage from one configuration to the next, and who will bring reason into the configurations? Geology does something to explain geography, but in the end, the shapes of land and sea have to be discovered and mapped. Stellar scatterings show broad patterns of distribution, but no approach to such order as might make telescopes of higher power superfluous. Whatever emerges from the queerness of nature into human affairs becomes a bit queer through its birth: custom, art, religion, law as we find them are all 'positive' — they have to be learned, not deduced.

These several inadequacies of our ideas are an inner aspect of that 'objectivity' of the world whereby it is firmly

other-than-ourselves: it is over against us. However much our equipment grows, the kernel of the object remains undeciphered — perhaps undecipherable. Fate, they say, is above the gods: fact in its totality is above the ideas, incommensurable with them, beyond their reach. Or shall we rather say that there is here a phase of the mystery of things which we are justified in treating as a problem rather than as a *cul de sac?* We hear of a "problem of evil"; but if evil is a problem it is only because of a perhaps unreasonable expectation of reasonableness in human fortunes. If evil is a problem it is only because fact is a problem: the puzzle lies not so much in the existence of suffering as in the apparent meaninglessness of its distribution. We have only to disabuse ourselves of the effort to understand, and evil ceases to be a problem, and fact with it: for a true positivist, there is no such problem.

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It is clear that we can take the inadequacy of our ideas in two ways. We may regard it as remediable, in which case the pursuit of adequacy is hopeful, and indeed obligatory: or we may regard it as irremediable, in which case the pursuit of higher degrees of adequacy is, for thought, a mere palliative. These two ways correspond roughly to the deepest traditional contrast in philosophy, which without prejudice we may here utilize.

One way of thinking holds that our ideas, though not now adequate, are in principle adequate to facts, since facts are ideas in disguise — an 'idealism.' The other holds that ideas are in principle inadequate, since ideas are themselves but facts in disguise — a 'realism.'

By its present definition idealism is committed to work for an understanding of the world; realism must be content to describe. And if we agree that science is the attempt to achieve an accurate and usable description of the world, realism, merging philosophy with science is less a type of philosophy than a resignation of the specific philosophic effort, whereas idealism in this sense is less a type of philosophy than philosophy itself.

At the present time, both modes of thinking are in difficulty in their dealings with fact.

Idealism, I shall try to show, has not yet made good its claim to indicate how ideas may become adequate to fact. Its characteristic attitudes of disdain toward 'mere quantity,' 'mere fact,' 'the contingent,' are not signs of strength. They amount to an admonition to Stoicism, to rise superior to circumstances through the firm will to adhere to the ideal. Some Stoicism is essential to any life worthy of a human being: there is a pettiness to be overcome in dignity. But the Stoic principle by itself tends to alienate the self from that rootage in fact which is indispensable to fertility and effect. To 'overcome the world' must not mean being weaned away from it; otherwise the specific issue of fact is evaded, and reaction to the realism of non-principle is invited, or to the willowy pragmatisms of 'immersion in the flux' hoping somehow to escape to firm soil and clear thought.

Realism on the other hand is in process of dissolution. In alliance with logic it has done great service in diagnosing old errors and providing compact languages for explorative thought. But it suffers from a melancholy implication of its own productivity. There appears to be no necessary limit to the invention of systems of logic, languages, sets of postulates, hypotheses; and as the spectre of uncontrolled infinitude of logic systems appears, the worth of any one proposal sinks to zero. Resort to 'convention' is a confession that no one conceptual description of the world of experience is necessary: the hope of establishing 'the true description' breaks down. And in this case verification is no longer possible, and induction loses not only its grounding but its goal. We are witnessing the nemesis of ingenuity in philosophy.

Through these two major discouragements, we stand today at the opening of a new stage of thought. It will do justice to the realistic aspect of fact, the objectivity of the world. But in doing so, it will give new life to that specific idealism sketched above, which is identical with philosophy.

## Lecture II: Facts and their Shadows: Facts and Ideas

We return to our rude description of experience as a meeting of a world by a self in successive acts of attention. The existent object of a single act of attention is, in general, a 'fact.'

It is the act of attention which outlines the fact and counts it as one fact: this outline need correspond to no demarcation in the field of the object. Hence the outlines are freely variable. Facts may be extensive or minute: a war may be a fact, or a falling snowflake; the grain of experience may be coarse or fine. Nevertheless, attention is aided by demarcations in the object-field; it seizes on them as the foot of a climber seeks knobs and niches in the rock. This provides mankind with its first philosophy of world-structure: that the world is an aggregate of discrete facts — and in its sophisticated forms of atomism and analytical realism, some of its most recent philosophies.

But there is this paradox in the act of attention: that in attending, we are aware of excluding something from awareness. We are meeting our world; we are attending, as a rule, to a very small part of it, the present fact. We are quite clear that the "fact" is not the whole of the situation: in attending to it, we have renounced wholeness. Yet, because the renunciation is deliberate, the whole remains, as present to thought, and as pertinent to the nature of the fact attended to.

Thus for human consciousness, fact is always accompanied by its shadow: its formal atomism is but a working ruse, deceiving none but the philosopher. Yet this inherent duplicity of the field of human awareness — the vague presence of the whole, the vivid presence of the focal fact — is prolific in consequences, some of which we must trace.

One consequence is the stability of the whole, as the facts change. The remoter whole remains shadowy; but out of it emerge nearer wholes, the "contexts" of our facts. These contexts, or "fields," have a relative stability. Thus, the several action-elements of a play may be taken as successive facts, all of which are placed, as they come before attention, within the stable context of "the play." So, the eye flits, but within a stable spatial field.

The limitation of fact would throw experience into a time order, even if it had none of its own, so long as there remains this demand of the whole-to-be-known: the facts can compose the totality only successively. Each fact as it appears

is "now": each looks back on facts which have been "now," and forward to "nows" to be. And these many not-nows, now present with the present now, constitute a stable time-field.

Thus the attempt of acts of attention to constitute a discontinuous series is frustrated by the blending-power of this persistent time-sense, and also by the accompanying sense of *interval*. The intervals between facts are, for the atomism of attention, nothings: but for the persistent whole-sense, they have direction and quantity, are positive items of awareness. The "rests" in music are a positive part of the music, as any player who omitted one would find out. Intervals and relations between facts become facts of a second order. They give positive substance to the stable but relatively shadowy awareness of the whole.

As the whole to which any fact belongs becomes defined in awareness the doubleness of consciousness becomes likewise defined, and affects the sense of the fact. The fact acquires a double character; it is itself, and it is the whole *minus something*. In a journey of 100 miles, we have to say of each intermediate point that we have come (say) 40 miles, and that we have (say) 60 miles yet to go. This negative or reciprocal aspect of fact may be the more important aspect, as when a cashier whose books call for $100,000 can show assets of $90,000.

As the whole is great, the single item is proportionately small. Considered positively, it is enough to occupy attention: considered as the whole minus $x$, it approaches insignificance. If there were such a thing as an infinite whole — though the expression appears to unite incompatibles — each member fact would be, on its shadow side, infinity minus infinity — in effect a lost fact.

Now this double conception of fact is characteristic of human mentality. The animal attends, but shows no concern for what he excludes: he is your true positivist. The animal uses the causal relationship in building his habits; but he makes no attempt to consider the totality of all the causes which bear on his enterprises: he is not stung by the sense that there are causes he does not know. His responses are therefore conventional: he can be caught! He makes no mental totality of

his lifetime, has no notion of the "days that remain to him," nor of the approach of death. He has seasons but not anniversaries. He does not die of ennui at the treadmill, because his mind is not busy with what he is *not* doing.

But for man, even the simplest fact is seen in the light of what it is not. Especially, he finds himself impelled to frame the idea of "the whole." And with this idea, every included fact, including his own existence, becomes as if lost in an infinite shadow. The arrival of this conception may be considered as marking the dawn of human reason.

The whole, as boundless, is a disturbing conception, never indifferent. It excites dread, yet man is drawn to it as to his native habitat. The fear which is aroused by the notion of cosmic boundlessness is due not to the boundless as such, but to the disproportion between the whole and the finite fact. For with the accepted limitation of attention, the problem arises of telling off the boundless in a series of successive steps. The mind is oppressed by the self-imposed demand of concluding an unfinishable task, the counting of an arithmetical infinity.

One must ask, therefore, why the human mind, in the act of attention so deliberately narrows down its field, so spontaneously accepts an infinite limitation ?

The answer cannot be found solely in the adjustments of our sense organs. It is true, no sense-organ could be devised, on a causal pattern of perception, which did not throw the world-vista into perspective; we must touch the world piece by piece, not in an equable all-at-onceness. But the focus of sense is at least as much a product of attention as attention is a product of sense. For even within the limits of what sense opens to us, we restrict our observation. Neglect of the remote is a common trait of all consciousness, animal and human; deliberate abstraction from the available field is the usual practice of mankind.

The answer is to be found in our mode of apprehending the total task of cognition. We can afford to go deep into limitation, to make our facts minute, and to take all the advantage of a sharper perception of a smaller object, because we do not have to carry the whole burden of adding fact to fact

throughout an infinite field: our perceptions have a way of becoming *self-multiplying*. In so far as they yield *ideas*, acts of attention accomplish an instant command of a strand of infinitude.

It is possible for perception to rest solely in the present fact; or to content itself with retaining a memory-image, still particular. But in man, the instinct of induction is irrepressible: to attend to fact is to take it as a "type," to conceive its object as capable of repetition indefinitely within its infinite field. Thus knowledge of the single fact confers command of all "like" facts; in mastering what is before us, we master what is beyond us; the world in its whole extent falls prey to the minutest attention, so far as this succeeds in penetrating the "essence" of the object.

But thus to attend to the object is to *split apart the idea and the fact*, the universal and the particular. We have been presiding at the birth of a distinction. To take the single fact as a type is to beget a general idea, or "universal," inclusive of many other facts, actual or possible. But in the same act, the present fact is set apart from all these others; as excluding them, it is "particular." It is the nature of the general idea not to be confined nor confinable to any one position; to be identical in every one of its "instances"; to be changeless. It is of the nature of the particular to be *placed* (whether in space or in time or in both); to be like other particulars but identical with no other; to be subject to change.

It is the nature of the general idea to be freely prolific within its own realm within the half-world of imagination, and within the world of possible particulars: to every universal, an indefinite number of particulars. It is the nature of the particular to be prolific in universals, as our varying questions elicit from it varying "essences" and respects of similarity. Thus a pearl may be conceived as a jewel, a morbid biological product, a piece of money, an item in a mediæval medical prescription. To every particular, an indefinite number of universals.

In the present stage of discussion it is desirable to insist on this seemingly obvious distinction between universal and

particular. There are those who doubt whether there are general ideas in any other sense than that of particulars, or parts thereof, used as signs of other particulars. There are others who doubt whether any such things as particulars are to be met with in experience, inasmuch as what we know is always an "essence" or "quality" which is an incipient universal. These two doubts might indeed be allowed to discredit one another. But their motive lies in the true observation that neither universal nor particular can be defined without circularity; for we are here at the very sources of definition. The answer to these doubts is to present, instead of definition, the derivation of the distinction, showing how it arises within the act of attention; this we have done.

It is now in order to draw certain conclusions.

## Lecture III: Necessity of the Contingent

The two proposals which we have just made — that to each general idea there are an indefinite number of (possible) particulars, and that to each particular there are an indefinite number of (possible) universals — carry the following conclusions, in which we pass through certain logical commonplaces and beyond.

*No universal requires to be embodied in any one particular.* The notion "tree" does not specify any position in which a tree must exist. The universal is itself in the possible specimens as well as in the actual specimens: and since not all possible specimens exist, the existence of any one cannot be due to the call of its "essence" alone. No general idea can prescribe when or where it is be embodied, or whether it is to be embodied at all.

*Every combination of universals is a universal.* Hence no combination of universals can determine, or identify, or require any particular.

*Every combination of particulars is a particular.* A solar system is a congeries of innumerable particulars; it is itself a particular fact. If we could speak of a scale of degrees of particularity as indicating the range of possibilities excluded

by the existing case, we may state the rule that the more composite the particular, the more particular it is. The universe as a whole is thus not only a particular fact, but the most particular of all particular facts.

*There is no general idea, and no union of general ideas, from which the existing universe can be deduced.* Sir James Jeans has suggested that the physical universe behaves like a set of mathematical equations. But equations are generals. They express laws of event which potentially have many exemplifications. No equation requires any one of the infinite number of collocations of event which might exemplify it. Given any one specific configuration of the world, the equation may determine all other configurations; but without this initial gift of the particular, the mathematics are powerless to give us a world.

This indicates the point of failure in the system of "necessity" proposed by Spinoza. His whole ethic depends on our capacity to reach an intuition of events in their absolute necessity. But he has only the relative necessity whereby the events in a determined system cohere *en bloc;* he can show no necessity for this particular system of events as a whole. His suggestion is that all of the possibilities in God's infinite nature must be realized. But there is no such *Menge* as "all of the possibilities" (by the law of the degree of particularity above mentioned). If God's nature is purely rational, no existent universe can be determined by it; and, by inclusion, not *this* universe.

Leibniz' attempted improvement on Spinoza fails at the same point. This particular world, he suggested, is not the all-possible, but the best possible. The "best," he thought, must in any case be a particular. But there can be no best of a non-existent collection; and the *Menge* of "all possible worlds" does not exist, nor have any specific meaning.

There is this further fallacy in the argument of Leibniz. The idea of the "best" is defined by some desirable quality or some group of desirable qualities. But *every desideratum is a general idea.* Even the most specific of such desiderata —

let us say a demand of a specific craving for a special kind of food — is still general, incapable of prescribing in advance the detail of the individual items which may be commandeered to satisfy it.

So all of the ingredients which might enter into the conception of the best world — as that it should have a degree of regularity, a degree of surprise, that it should allow scope for organic life, for human life, that it should present sufficient difficulty to call out our powers, and not so much difficulty that they would be stifled in the cradle — all such desiderata indicate classes of worlds; and not all of them together can indicate a particular world — this world.

These deductions do but further enforce the realistic proposal that idea and fact are incommensurable; the particulars remain obdurate to every effort to bring them within reason. This is not an accidental situation, due to the circumstantial feebleness of human powers, which some diviner insight might conceivably surmount. It lies rather in the nature of the gulf between the universal and the particular. It is necessary that an irrational element should enter into the fabric of existence.

To have shown the *necessity of the contingent* is not unimportant: it brings the sphere of contingency within the sphere of the rational. But taken alone it surrenders the particular to the ultimate "mereness" of mere fact! These difficulties were appreciated by the great German idealists, and by their successors in Britain and elsewhere. Have they succeeded where Spinoza and Leibniz failed?

Hegel was well aware of the difficulty of Spinoza's position. In Spinoza's system everything is necessary except the "modes" — which are Spinoza's particulars; and this is to say that no actual thing is necessary. Hegel then undertook to show that by taking as his first principle Spirit instead of Substance the universal would become "concrete" — would assume the form of nature, with all of the particularity of physical fact. But giving Hegel's argument its full scope, it can only show that Spirit requires some physical embodiment;

it cannot show that it requires *this* embodiment. It thus remains in the realm of the general, and does not touch the ground of physical actuality. That it does not do so is asserted by Hegel himself, in his complaint that philosophers stultify philosophy when they try to deduce as necessary the varied shapes which nature assumes, since nature is "the playground of contingency."

## Lecture IV: Mutual Need of Idea and Fact

The idealists of Germany, from Fichte to Hegel, were the first to appreciate the full importance of the failure of Spinoza and Leibniz. Kant seems hardly to have concerned himself with it: his concern was to get away from the "merely empirical" to the forms of pure reason. He accepted the *Mannigfaltigkeit* as a datum, whose being is indeed beyond the reach of thought, but whose *significance* is solely that which thought confers upon it. For what is "significance" or "meaning" if not thought?

It was precisely the material of sensation — the colors, sounds, touches, etc. — which Berkeley had somewhat ineptly been calling "ideas," — it was just these which Kant accepted as the deposit in us of an inaccessible outer agency, a *materia prima* of experience, for which no further account could be given. So far, Kant accepts the standpoint of empirical realism. But his followers saw that it was precisely this particular stuff, for which they must account.

Their general line of attack was what might be called a strategic retreat! They recognized to the full the obduracy of facts, and then attempted to absorb them into the self on the ground that the self has need of just such resistance and opposition. In this they followed a clue given by Descartes: for it was he who had made sharpest the disparity in kind between mind and matter, thought and extension. Thought is not extended; extension does not think: they are essential opposites.

The German idealists enlarged on this radical contrast. Thought is infinite; the particular stuff is finite. Thought is active; the particular stuff is inert. Thought is one; the stuff

is manifold, divided. Thought is internal; the stuff is external, both to thought, and among its own parts. Thought is necessary; the stuff is contingent, accidental.

Having thus pursued the opposition to the extreme, the idealists then observe that thought, emptied of all the qualities ascribed to the stuff, is jejune and helpless. To say that mind is infinite but *not finite*, is as much as to say that it is not definite, has no character, no form, is not even conscious — is not a mind at all! Without the stuff of sensation what we have is not mentality, but only ideas devoid of instances. Without the opacity and the resistance of the stuff of experience, the self is devoid of that incentive to effort of thought and will in which self-development as well as the "mastery of nature" is achieved.

What the self thus requires, in order to be itself, argues the idealist, the self may be regarded as producing.

It is to be observed that this *need* is precisely the consideration which the realist takes as his major evidence that the mind is *dependent;* as a separate "pure reason" it is not helpless so much as a meaningless non-entity. It must therefore derive its being from the factual. But what the realist has not observed is that the stuff is in an equally jejune and futile condition, if it is emptied of all the qualities allocated to mind in this list of opposites. What, for example, can be meant by matter if it is to have no unity, no necessity, no internal being, no activity — in short, if none of the "categories" pertain to it in its own nature?

Kant was willing to divide the honors, but this was equivalent to dividing the babe! It is futile to attribute substantial being to an entity which cannot so much as be defined. If each side needs the other in order to exist; and if one of the two must be fundamental; it must be that one which exhibits spontaneous or creative possibility. This is the basis of the idealistic hypothesis. Matter is to be derived from mind, and not mind from matter.

Thus, the need, which to one thinker is the sign of the mind's dependence, is to the other the sign of its creativity!

But it is not left at that point, as a merely alternative hypothesis. An attempt is made to show *how the mind proceeds* in the activity of developing its needed opposition.

This process the different idealists conceive in different ways. It will not, perhaps, be too wide of the mark to say that each one here devises his own *myth*, in a somewhat Platonic sense of the term. For admittedly, the process is not empirical; for if it entered experience it could not constitute the groundwork of experience. Fichte is clearly conscious that if the particular is to be explained, the particular can not be appealed to in the explanation: it is necessary to leave the realm of "facts" in order to derive facts.

Fichte's myth is that the Ego "sets over against itself" a determinate non-ego, and proposes his famous notion of the "Stoss." Hegel's myth is that the Spirit alienates itself from itself, "enters into the realm of Otherness," which is Nature, accepting the forms of space, time, externality, dividedness.

We are not here concerned with these myths, except to remark that they share with the hypotheses of atomic physics an absence of direct empirical meaning; they may be well content with sharing this situation of positivistic meaninglessness, if they can vindicate themselves on other grounds. Our concern here is with the prior question: whether, if we accept them, we have accounted for the particular.

The answer has to be that we have accounted for a realm of particularity, but not for any particular.

Hegel, who in his respect for the concrete and his demand for beginning with experience, includes in his sweep a recognition of the realistic element, still exhibits a certain scorn or impatience of the particular, as in his footnote aimed at Herr Krug. In his remarks on the contingency of the particular contents of Nature, animal forms, etc., Hegel attributes this variety to the "*Ohnmacht der Natur*," sees rightly that the particular selfhood of human individuals is in the same case, and dismisses both as "accidental." Thus Hegel abandons the opportunity which seemed to offer itself in the resources of his thought for concreteness.

Royce wholly overcomes this scorn, and takes the full measure of the problem. He holds that the particular is not an object of knowledge, but an object of will: it is something we intend. (Here, Royce has a point of contact with Fichte, with Husserl [*intentionale Erlebniss*], and with Whitehead [the particular as a "decision"]). The scientist cannot perceive his ultimate particles, which are to be the most perfect particulars: he can only postulate that they must exist. The lover cannot prove that his beloved has no exact duplicate in the world; nor that the person now in his presence is identical with that so similar person of yesterday: it is the deep impulse of his love and loyalty which insists that she is indeed herself, since there can be no other such as she. This same principle Royce extends to all particulars; it is our loyalty to the world which obliges our recognition of them, not any character they bear on their faces, for all "characters" are universals. Thus for Royce the particular is an expression of purpose in the form of love or loyalty, and is thus taken up into the self.

There is a profound truth in this theory, in its insistence that all facts engage the will; that apart from the self and its feeling there can be no facts for us at all. But this *does not extend to the creation* of those facts. The mothers whose babes have been interchanged cannot rely on the reality of their love to *constitute* the identity; if they could, there would be no anguish in the situation. Instead, it is just because of their love that they must seek with the utmost concern for some external and particular sign to establish the identity. Love takes its rise in a discovery; it creates, but within a frame of the given fact, the being of the beloved. Hence it cannot by itself determine a fact, nor a world. Idealism has not so far succeeded in absorbing Fact into Thought or Purpose.

## Lecture V: The Resumption of Reality: Creation of Symbol

So far, the hope of philosophy seems blocked by the obduracy of the particular fact. And we are sometimes counselled, not alone in the name of empirical realism, but in the name of

natural piety, to recognize the gulf between idea and fact as unbridgeable.

Kierkegaard held it as a major reproach against Hegel that he always "went on to a synthesis." Life, thought Kierkegaard, is bound in antitheses for which there is no intellectual solution, and in which the pretence of solution is either *superba* or immorality. We are not to synthesize right and wrong, good and evil, but to choose between them and expunge the evil: it is Either-or, not Both-and.

So likewise with the gulf between universal and particular, essence and existence: it is, we are told, an aspect of the gulf between man and God. For it is God who establishes *Sein:* and human ideas are but efforts to grasp the "essence" of his work — efforts which infinitely renewed grasp only "essence," never existence. This point Kierkegaard has in common with Thomism, with the neo-Thomism of Gilson, and with the Catholic Existentialists. From this point of view the idealistic demand to understand the particular, to bring it into the sphere of idea, is pure presumption, the essence of impiety.

To this we must answer (1) that the light here thrown on particularity and *Existenz* is of the first importance, bearing portentous fruit in our time; (2) that a call for piety toward pure existence is nevertheless self-contradictory, for if Being has a divine character, that is an element of essence; (3) that the sort of piety here urged is the piety not of Christianity but of Islam: it is Resignation! To stop at this point is the surrender not of idealism alone but of philosophy. The way is difficult, but we must undertake it.

That the gulf is not absolute we know because we have presided at its opening (p. 329). If it may open, within experience, may it not also close? What we have called the rise of the distinction between universal and particular is commonly, though inaccurately, described as the extraction of universals from particulars in empirical judgments. "This object," we say, "is grass": and in so saying, the particular has yielded up to us its kind or type. We continue: "This grass is dry"; "This dry grass is ripe for cutting" — at each step releasing some universal from its concretion in the thing. Only, from

these universals we cannot recover the particular: the *jinn* is out of the bottle and will not go back; no notion of "dry-grass-ripe-for-cutting" can yield this specific field.

And though no further pushing of the cognitive process, in the reverse direction of "deduction," can regain the particular, does not *volition*, indeed, when it reaches the point of action, accomplish just this reverse passage? Does not an achieved act of will pass from the general idea to the particular deed? It is true that *desire* does not accomplish this; for desiderata, as we pointed out, are all general. But desire and deliberation are stages of will preliminary to the will-act itself. Action is necessarily particular; hence, in arriving at the point of action, the will must in some way have passed from the most general of our wishes and hopes to the particular stroke of the deed.

Through the will-act we have the experience of *making fact*. And since, in general, we understand what we make and only what we make, we may find in this experience a clue to the meaning of the particular.[1] Drawing the contrast in its roughest terms: knowing receives its facts; action *adopts* facts, in order to constitute a new fact.

In so far as I have the experience of altering reality, I feel myself to be real. In spite of Descartes' dictum, to *think* is not, in the full sense, *to exist*. Empirical thinking is half-existing; in observing the object I *am* neither the object nor fully myself, I am "giving myself to the object," accepting from it a loan of its own reality. But *to will is to exist*. For in the will-act I summon my own reality to confer it upon the object.

In knowing, there is something tentative. I "attend"; I stretch toward the object to gain from it its power; as I do so, I have a growing sense of my own power; I am aware that the

[1] The appeal to the will in some form or other to settle the quandaries of reason in metaphysics has been common in philosophy for at least a hundred and fifty years. This appeal is illicit, whether in the *Kritik der Praktischen Vernunft*, or in recent forms of pragmatism and actionism. There can be no answer to a rational question except a rational answer. But the phenomenology of the will may provide those objects in which the rational answer is to be found. This is the direction of our enquiry, which in subjecting will to thought, takes the opposite direction from pragmatism.

time is coming when the rôles will be reversed, the object will attend to me. As with completer observation, I extract from the object more and more of its essence, I build my world of ideas, and rejoice in it for its own sake; but I am also building lightning into my cloud. There is increasing tension, almost duplicity, as I push farther apart the world of idea and the world of fact. In action, this tension is released; the two worlds resume their union.

In knowing and in acting alike, I am accepting an infinite limitation. But in action, I know what it is that I renounce.

And note that every act is, in its first intention, a success. For the first sphere of the will-act is the body; the muscles obey whether the more outward world obeys or not, or rather, the movement of muscle is the outward form of the will-act itself. Here Schopenhauer, usually so exact in observing the will, is at variance with fact. The will always reaches its first aim. That one can exercise will at all constitutes the undercurrent of vital satisfaction: external matter has accepted the stamp of my idea — this is the elemental and repeated triumph of my being.

The nature of the will-act, thus rudely described, is more completely seen in the emotional accompaniments of action. There is pride — the elemental pride just spoken of — because one has evinced the virility of turning idea into fact, is no mere dreamer, is capable of resolution, of breaking through into deed. There is also an inescapable pain, as of regret not untinged with shame, because in accepting limitation one has renounced the freedom of boundless possibility for the confines of a single act, in this sense has abdicated a kingdom. And there is a feeling of mystery, as if in this experience the nature of the self had merged with, and intuitively perceived, the nature of the world — as though this elusive process of "fiat" had indeed no empirical psychology, but instead, a metaphysic! Let us explore this farther.

In action, we adopt particulars into our life-circuits: we cultivate a field; we cut a quill and use it as a pen. We sign our name to a legal paper; the law defines this, the signing, as the mark of finality, the deed is "executed"; some relic-hunter

makes away with the quill! Gandhi fasts, and breaks his fast by drinking a cup of orange juice; some one spirits away the cup, as emblem of a turn in Indian history when temples were opened to Untouchables.

What has happened in these adoptions of fact? The field remains a field, the pen and cup remain pen and cup. But they have *taken on an added meaning*. The particular object, Gandhi's cup or Herr Krug's *Schreibfeder*, while keeping its own physical "essence," has accepted an idea (Gandhi's idea or Krug's) as its dominant "essence." In the fiat, two things have happened: the idea has become fact, and the fact has become idea: the Word has become flesh, and the flesh has taken on the meaning of the Word. The physical object is no longer its impersonal physical self; it has become a *symbol*.

In all will-acts we can discern this *promotion of essence* of the particular. Action, we may say, is a marriage of universal and particular in which both for the first time are "realized." The "essence" takes on "existence"; but without such existence it is not fulfilled as essence. The "existence" on the other hand, in taking on its new "essence," comes into its fulfillment. As an abstract physical object, it has less meaning than it was capable of; it was impersonal fact, now it is a *body* with an indwelling *anima*. As inanimate physical object it is patient to any imposed essence; as it is made use of, it acquires a final cause which not alone takes precedence, but takes command, of the other causes. It is identified with its new meaning: that is now what it *is*.

For our problem, the critical circumstance is that in the will-act the obduracy of fact is for the moment and in one point overcome. The physical fact, in lending itself to my purposes, has not surrendered its physical otherness. But that otherness has dropped its veil; there is a reason for its mechanical character, its absence of life, of psyche. It must be "inanimate" in order that it may be fully patient to the imposed meanings. If the particles of nature had an inner life of their own, the compulsion I exercise on them in exploiting them might well be a cruelty on a monstrous scale; plowing my field, blasting my hillside, would become not fulfillments of latency, but viola-

tions of an infinite privacy of natural being: Nature would cry out to be let alone! Contemporary tendencies to panpsychism misread the reality behind physics: there is such a reality, and it is living; but it is one, not many. And with a unity in the Thou beyond the surface of fact, the infinitudes of space and their filling, and the unfathomable minuteness of Nature's grain, lose their power to appall. They are there for what they may come to mean.

### Teleology of the Particular

How far does this metaphysic of fiat provide a general interpretation of the particular? It is the thesis of these lectures that we have here a clue to the meaning of all facts, and thus to the nature of the world. It is the destiny of few facts to become symbol in the specific sense of a common language — lotus, Cross, marriage ring, handshake; it is the destiny of all fact to become symbol in the wider sense of entering into the uses of personal purposes. And the teleology of the world is apparent chiefly in this, that the particulars which environ us prove to be such as we can clothe little by little with the meanings for which they have waited.

History and biography are narratives of fact; but of what fact? Only of such fact as has become the vehicle of meaning. History might be defined as the continuum of human or national symbols; biography as the continuum of personal symbols. Human survival on the planet has depended on the fact that the environment of human life has lent itself largely, though irregularly, to the circuits of the human will: human destiny and happiness depend on the degree to which the whole world of fact may be considered as raw material for future will-acts. To regard the world as the best of possible worlds, we have judged an unmeaning expression; to regard it as a vast particular incompleteness, plastic to such meanings as purposive beings may conceive, perfectible without limit — this is a significant hypothesis.

On this view, Schopenhauer was right in looking to the will for the coincidence of appearance and reality, and also in recognizing an irrational element in the web of the world. But the will as subjective impulse to live is not reality; the

will is not real except in "fiat" when it fuses fact with idea. And while Schopenhauer regarded the irrational element as the fundamental thing in will, and held that the will to live is blind, our view holds that the irrational element is secondary, a mere empty "valency" for the rational in the shape of symbol, the intuitive artistry of power, historic action.

Fichte and later idealists were also right in pointing out that the ego has need of the opposition supplied by the "divisible non-ego" over against it. But they were wrong in supposing that the chief function of the material element is *to resist*, or to be a *realm of otherness*. Its chief function is to serve as a latent resource for an infinite succession of will-acts depositing in it cumulative meanings. *Die Welt ist das versinnlichte Material unserer Deutung.*

The relations of this view to current problems and theories are manifold: I shall not attempt to outline them. They will appear in the development of the arguments which support the hypothesis here stated. This hypothesis we may describe as the *teleology of the Particular*, as distinct from the teleology of the general characters of the world. But I may indicate in conclusion the three major obstacles in current thought which such a view has to encounter.

First, the infinitude of the world is held to be contradictory to any notion of its wholeness, and hence to any ascription of character or *telos*. This will require an investigation of the logic of the infinite. Second, the empirical character of fact, and its temporal flow, are obviously plural, and apparently inconsistent with any notion of stable being and meaning. Third, absolute unity is held to be meaningless both for the human mind and for human destiny.

If these objections are valid, we should have to revert to the realistic judgment that the presence of facts which lend themselves to the course of our action is a local accident of the universe, and no symptom of the nature of things. It becomes the task of the lectures to deal with these obstacles in the course of constructing the outline of this metaphysic.

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# THE DIALECTIC OF CONTRARIES AND EXACT RESEMBLANCES

It would appear that no one has denied the existence of resemblances in the sense in which it is common usage to say that light crimson resembles dark crimson. Such is not the case in the matter of exact resemblance. The existence, even so much as the possibility, of an exact resemblance has been denied systematically as a matter of principle by Hegelian Idealism. This denial is based on no attempt to muster an empirical demonstration of a Leibnitzian identity of indiscernibles. Rather, the denial is part and parcel of a conception of identity as identity in difference that is of the very essence of the Hegelian dialectic of contraries.

The phrase "identity in difference" has been regarded by some thinkers as a matter of mere mystery-mongering. How can differences nevertheless be identical? The phrase is transparently absurd.

Such is, of course, the case in the light of the Law of Non-Contradiction. But in the philosophy of Hegel, as in that of Bradley, the Law of Identity is denounced and repudiated. Those imbued with unquestioning confidence in the Laws of Thought turn away from the suggestion that this could be done as from something wanton. Yet there was nothing unconsidered about it.

Hegelian philosophy takes *becoming* seriously. In this regard, as in others, it breaks sharply with the thinkers of the seventeenth century and the pre-critical thinkers of the eighteenth. For them, changes are matters of succession, not of growth and development. One state succeeds another; there is no question of the growth of one phase into another development.

Now, it is an old story that change is unintelligible. How can A, which *is* A, change into Y, which *is* Y. Let the process of change be a matter of stages as minute as you wish. Still, in the course of the process, however conceived of, there finally would be a moment at which A would no longer be A, and

would not yet be Y. Yet to say, in any case whatever, that A may be both A and not A is to utter a self-contradiction. That contradiction would be implicated in any view on which it were held that one self-identical being may become another self-identical being. What is self-identical may not become: it may only be itself. Any view of change on which what changes is self-identical must, then, be abandoned. The truth to be elucidated by the dialectic that supersedes abstract and static logic is that changing reality is becoming. In Hegel's *Logic* becoming is the primary category in and through which the initial synthesis of the dialectic is made: namely, that of being and nothing.

Bradley's philosophy affords the classic English variant on the dialectic of contraries. In the interests of a method by which Appearance (or experience in becoming) could be elucidated, Bradley denounces the Law of Identity on the authority of Hegel. Thus Bradley writes in his *Logic*: "The principle of identity is often stated in the form of a tautology, 'A is A'. If this really means that no difference exists on the two sides of the judgment, we may dismiss it at once. It is no judgment at all. As Hegel tells us, it sins against the very form of judgment; for while professing to say something it really says nothing. It does not even assert identity. *For identity without difference is nothing at all.* It takes two to make the same, and the least we can have is some change of event in a self-same thing, or the return to that thing from a suggested difference. For, otherwise, to say 'It is the same as itself' would be quite unmeaning. We could not even have the appearance of judgment in A is A, if we had not at least the difference of position in the different A's; and we cannot have the reality of judgment, unless some difference actually enters into the content of what we assert." [1]

Hegel "tells us" that a tautology "sins against the very form of judgment." There is "the appearance of judgment in A is A" merely because each A is in a different position. This will not do. One A is enumerably different from another A, to be sure; but "unless some difference actually enters into

[1] *Logic*, Vol. I, p. 141. Italics mine.

the content of what we assert," there is only the appearance of judgment. "For identity without difference is nothing at all."

Those who are accustomed to regard numerical differences as genuine differences, may be perplexed by the above quoted statements. In A is A, they might urge, there is a difference: that of the one A from the other. Thus the one A is existentially different from the other one. Now, as may become plain in the course of this paper, the doctrine of identity in difference denies that mere numerical difference makes sense. "Numerical distinction is not distinction without difference, that once more is senseless . ." [2] The difference which Bradley demands is difference in quality or character. "Without difference in character there can be no distinction, and the opposite would seem to be nonsense." [3] In a tautology the two terms are not different in character. Therefore, in Bradley's view, they are not really distinct, "and the opposite would seem to be nonsense."

In a tautology there is no movement in thought at all, but at best the assertion of the barren identity of two symbols. Since all that exists is in becoming, thought devoid of development would be at best a mere association of images recollected. An association of ideas could be no judgment, for associations are recollections of, not developments in and of ideas.[4]

A genuine judgment, as distinguished from an association of ideas, will (it is held) assert unity in diversity, not the empty identity of the tautology A is A. In the absence either of differences united in judgment, or of the unity differentiated by the differences, judgment is absent. For unless the different constituents of a judgment are in some sense united in it, there is then no judgment but, at best, an association of ideas. On the other hand, unless it be differences that are in union, there is no judgment, but rather the mere utterance of strict tautology, and so no movement in thought.

Thus we may see that the formula of judgment may not be A is A. On this view, we are required to realize also that

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[2] *Appearance and Reality*, p. 531.

[3] *Ibid.*, p. 532.

[4] See the *Logic*, Bk. II, Part I, Ch. I.

the formula of judgment may not be A is B. For in this latter form we assert (it is assumed) that A is identical with, or strictly the same as, B. This being so, we are confronted by an alleged dilemma: on the one alternative, A is A, we assert nothing about A; on the other, we say that A is what it is not, namely B. "And we seem unable to clear ourselves from the old dilemma. If you predicate what is different, you ascribe to the subject what it is *not;* and, if you predicate what is *not* different you say nothing at all." [5]

In Bradley's view, the source of this error may be brought to light by considering the nature of the contradictory, on his dialectic of contraries. "We have to avoid in dealing with Contradiction, the same mistake we found had obscured the nature of Identity. We there were told to produce tautologies, and here we are by certain persons forbidden to produce anything else. 'A is not A' may be taken to mean that A can be nothing but what is simply A. That is, once again, the erroneous assertion of mere abstract identity without any difference." [6] That assertion is erroneous because it rests upon the assumption of pure negation. Indeed, that assumption is at the basis of the traditional yet wholly erroneous understanding of the Law of Non-Contradiction. For the assumption that A is simply not B carries us ineluctably to the conclusion that A is A irrespective of its relations. And that conclusion, it is alleged, entails the above mentioned dilemma.

For this reason, among several others, there can be no place in logic for the notion of mere negation. "The contradictory idea, if we take it in a merely negative form, must be banished from logic. If not-A were solely the negation of A, it would be an assertion without a quality, and would be a denial without anything positive to serve as its ground. A something that is only not something else, is a relation that terminates in an impalpable void, a reflection thrown upon empty space. It is a mere non-entity which cannot be real." [7] In a word, mere negation is groundless verbiage. Every sig-

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[5] *Appearance and Reality,* p. 17.

[6] *Ibid.*

[7] *Logic,* Vol. I, p. 123.

nificant negation presupposes a positive ground. We cannot and do not deny a predicate of a nothing; rather we deny it of a subject on the ground that this subject possesses a quality which is incompatible with the predicate of our negative judgment.

Thus, in Bradley's view, the negative judgment does not express bare otherness or mere negation, between terms for which there would be no middle ground. Hence Bradley denies that the logical form of the contradictory, within which no middle term is possible, and the logical form of the contrary, within which a middle term is possible at least, are distinct forms of judgment. Consequently, he holds that the contradictory is one with the contrary. "But then this positive ground, which is the basis of negation, is not contradictory. It is merely discrepant, opposite, incompatible. It is only contrary." [8]

Thus Bradley holds that the notion of the contradictory, as it is formulated by formal logic, must be "banished" from logical theory. This must be so, he argues, because pure negation is absurd, and without mere negation, there may be no contradictory as distinct from the contrary. Pure negation is absurd because, "It is impossible for anything to be only Not-A. It is impossible to realize Not-A in thought." [9] Thus the contradictory can only mean what is meant by the contrary.

No rule that would comprehend the scope of the contrary could be formulated. For "contrary opposition is indefinitely plural. The number of qualities that are discrepant or incompatible with A, can not be determined by a general rule. It is possible, of course, to define contrary in some sense which will limit the use of the term; but for logical purposes this customary restriction is nothing but lumber. In logic the contrary should be simply the discrepant." [10] The contradictory is one with the contrary, and the contrary is simply the self-discrepant. Thus, wherever Bradley writes of a relational situation as being self-contradictory, he means not what a reader steeped in the Aristotelian tradition naturally would take

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[8] *Ibid.*, p. 123.
[9] *Ibid.*, p. 123.
[10] *Ibid.*, p. 124.

him to mean: rather, he means that the terms and relations in question are respectively contraries, and that by virtue of these very contraries that relational situation is self-discrepant.

Thus we may come to see something of what it means to say that identity is identity in difference; not the inane abstraction expressed by A is A. "The axiom of Identity, if we take it in the sense of a principle of tautology, is no more than the explicit statement of an error." [11] For all thinking is in becoming, and in the reaffirmation of the affirmed. In a tautology, there is no development at all. The traditional notion that an affirmation of identity is and must be tautological derives from an unmitigated error, of which the axiom of identity is "the explicit statement."

This error is the fantasy that there could be and is pure negation, or mere otherness. It is absurd to hold that A might be merely A, and so merely not B. This is absurd on two counts. In the first place, to say that A is not B is to say that A *is* what it is not, namely, B. (This line of argument in particular may well be deemed almost certainly fallacious; in any case, our purpose here is not that of a critic.) In the second place, it is absurd to hold that "A is not B" means that A *per se* is not B *per se*. For in that case there could be no ground for the *not*. It might as well be said that wisdom is not blue, or that a mind is not a coal scuttle.

It is well understood that pure negation (as unclarified by relevant advances in logic) permits the so-called infinite judgment. Bradley takes it that no case of pure negation may yield anything else. For this reason, he holds that a characteristic A may not be B, and the characteristic B may not be A, each one merely and simply in its own right. Rather, a middle term between A and B is requisite that there may be a positive ground, or justification, for the difference between A and B.

Any theory which requires that there be a middle term between any two terms can only repudiate the Law of Non-Contradiction. For, as is well known, that Law entails the Law of Excluded Middle on which there may be no middle term

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[11] *Ibid.*

between the terms of a contradictory. The contradictory must be "banished from logic." This is done by identifying it with the contrary. Since there is a middle term between the terms of any contrary, a basic requirement of a dialectic of becoming (as distinguished from succession) is thus fulfilled.

But "It is necessary before all things to bear in mind that the axiom does not in any way explain, that it can not and must not attempt to account for the existence of opposites. That discrepants or incompatibles or contraries exist, is the fact it is based on . . ." [12]

"If the principle of Contradiction states a fact, it says no more than that the discrepant is discrepant, that the exclusive, despite all attempts to persuade it, remains incompatible. Again, if we take it as laying down a rule, all it says is, 'Do not try to combine in thought what is really contrary. When you add any quality to any subject, the subject is as if it were not altered. When you add a quality, which not only removes the subject as it was, but removes it altogether, then do not treat it as if it remained.' " [13]

Now Bradley sees full well that in thus regarding the contradictory as "the general idea of the contrary" he offers his readers a forced choice between the square of opposition and his dialectic of contraries. Thus at the bottom of the next page, after having discussed further his identification of the contradictory with the contrary, he writes as follows: "My one idea here is to disarm opposition to the axiom of contradiction, as it stands above. *But I clearly recognize that, if not-A were taken as a pure negation, no compromise would be possible. You would then have to choose between the axiom of contradiction and the dialectical method.*" [14] This statement of the matter in question would seem to be fairly explicit.

The bearing of the dialectic of contraries on exact resemblance is perhaps best brought to light through a brief consideration of the theory of relations which it entails and elucidates. Yet, the foregoing brief exposition of Bradley's reasons

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[12] *Ibid.*, pp. 145, 146.

[13] *Ibid.*

[14] *Ibid.*, pp. 147, 148. Italics mine.

tor holding that "identity without difference is nothing at all," may make something of that bearing fairly plain. If there may not be two beings that are identical, if "identity without difference is nothing at all," then there may be no exact resemblances. And true-blue Systemic Idealists echo the words of the master, "identity implies difference," and deny the possibility of an exact resemblance. Truly no compromise is possible. If "A is A" is non-sense, then "this shade of yellow is strictly identical with that shade of yellow" is senseless. And any painter, no matter how great a master in the art of handling hues, who thinks he can avail himself of two cases of the same hue, is fooling himself. Identity without difference is nothing at all, and mere numerical distinction is senseless.

Something of the categorical sweep of this doctrine is apparent in the theory of relations which it entails. An extensive misunderstanding of that theory may be averted if, at the outset of a very brief statement of it, we bear in mind that Bradley does not use "appearance" as it is used, for example, by a proponent of the causal theory of perception. For Bradley "appearance" is not the name of a veil hanging between the percipient and the really real. It will be recalled that there is a classic tradition on which what is in becoming is appearance and appearance is what is in becoming. Those who read Bradley will recall that he writes of an "infinite process"; of a "principle of fission which conducts us to no end"; of relations that "break out," and "fall between" qualities in appearance; and of a "what" being "in collision" with another "what." And so on over and over again.

If one were to take it that, for Bradley, "appearance" is the name of something not in becoming or development, such as a sensum, one would have to take this idiom as mere metaphor. In the absence of becoming there could be neither "process," infinite nor otherwise; nor "fission," whether endless or not. And to take the idiom of a master of dialectical prose as the writing of bemused irrelevances would be more than arrogant; it would be silly.

As is well known, Bradley rejects Hegel's "ballet of bloodless categories." He also finds the dialectic of contraries

unable to arrive at a self-consistent elucidation of the two contraries that are for him the characteristics of appearance everywhere and always; namely, quality and relation. By the term "quality," Bradley does not mean anything like a sense-quality, thought of as self-identical. No more does the term "relation" in his usage designate anything like an eternal universal that requires at least two particulars for its illustration. For the self-identical and eternal may not be in becoming.

In Bradley's view, "quality" designates any moment of experience wherein immediacy is dominant and differentiation is recessive. And "relation" designates any moment wherein differentiation is dominant and immediacy is recessive. In any experience, the aspect of immediacy is quality, and the aspect of differentiation is relation.

In this sense of the term, "Qualities are nothing without relations. In trying to exhibit the truth of this statement, I will lay no weight on a considerable mass of evidence;" [15] namely, all of the evidence that goes to show how qualities are in fact varied by changes in their relations. Bradley rules out this evidence not because he considers it unsound as far as it goes, but because it does not go far enough. He believes the conclusion in question to be demonstrable *a priori*, and proceeds accordingly.

Wherever there are different qualities, there are qualities related by their differences. "For consider, the qualities A and B are to be different from each other; and, if so, that difference must fall somewhere. If it falls, in any degree or to any extent outside A or B, we have relation at once. But, on the other hand, how can difference and otherness fall inside? If we have in A any such otherness then inside A we must distinguish its own quality and its otherness. And, if so, then the unsolved problem breaks out inside each quality, and separates each into two qualities in relation. In brief, diversity without relation seems a word without meaning." [16] The difference between A and B, in virtue of which they are distinct, either "falls outside" or "between" A and B, thus to relate them, or that dif-

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[15] *Appearance and Reality*, p. 21.

[16] *Ibid.*, p. 24.

ference "falls within" A and within B, thus to differentiate each one of them within itself. On the latter alternative, the moment of relation would break out within A and within B. Therefore the difference that differentiates A and B must fall "outside," or "between," and thus "we have relation at once."

This basic point in Bradley's elucidation of his conception of relation may be illustrated by a process of cell-fission. In the very incipience of that process the incipient differentiation must fall somewhere. In point of fact, it falls "between" the incipient cells in the observable sense that it is their differentiation. As soon as we notice this much, then (on the assumption that differentiation is relation), we are aware of a relation. For we are then aware of a differentiation by virtue of which incipient qualities are differentiated, or, in Bradley's idiom, related. Thus, in this sense of the term, a relation is a liaison *au pied de la lettre*, rather than a nexus taken as a connecting link. Were a quality devoid of relations in this sense of relation as differentiation, it would be in no respect different from anything at all, and so would not be a quality or anything else.

Presumably it is even obvious that no static line between a differentiation and what is differentiated by it can be drawn and sustained in and by sentience, as distinguished from dialectic. For any relation, and any quality, will be in process. As incipient qualities become more and more immediate, their differentiations alter from stage to stage. And, as their differentiations become the more marked, the qualities are perforce altered. "Hence the qualities must be, and must *also* be related. But there is hence a diversity which falls inside each quality. Each has a double character, as both supporting and being made by the Relation." [17] That a quality may be itself at all, it must be distinct from something else. In order that a quality may be distinct, it must be differentiated from other qualities.

This differentiation is no third entity: rather, it is a liason that contributes to constitute the qualities it differentiates. In so far as A is immediacy or quality, A is not relation. Yet, that

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[17] *Ibid.*, p. 26.

A may be distinct, it must be at once itself, in so far as it is A, *and* the differentiation by which it is differentiated. A is both made, and is not made, what it is by relation; and these divergent aspects are not each the other, nor again is either A. If we call its diverse aspects 'a' and 'α', then A is partly each of these. As 'a', it is the difference on which distinction is based, while as 'α', it is the distinction that results from connection. A is really both somewhere together as A (a — α). But (as we say in Chapter 11) *without* the use of a relation it is impossible to predicate this variety of A. And, on the other hand, *with* an internal relation A's unity disappears, and its contents are dissipated in an "endless process of fission which conducts us to no end." Devoid of relation, A would be undifferentiated from anything else, and so would be nothing at all. As differentiated, A is at once the 'a' that is differentiated, and the 'α' that is the differentiation or relation. Thus "A is partly each of these." Neither 'α' nor 'a' is the other, "nor again is either A"; for 'a' is what is differentiated, while 'α' is the differentiation. This differentiation 'α' is essential to the 'a' that it differentiates.

That is the reason why "A is both made, and is not made, what it is by relation... It may be taken as at once condition and result, and the question is as to how it can combine this variety. For it must combine the diversity, and yet it fails to do so." A is at once 'a', the aspect of immediacy and 'α', the aspect of mediation, or relation. Without 'a' there is nothing differentiated, and so no quality: without 'α' there is no differentiation and thus nothing at all.

Any relational situation [18] is at once itself 'a', and its differentiation 'α', and this identity of A, which is A, a, α, implies its differentiation, which is 'α'. This is to say that the quality A is the moment of immediacy 'a' *and* the moment of mediation by which that moment of immediacy is differentiated from other qualities and relations. In short, that A may be at all, it must be at once what falls in process within itself, and what falls in process between itself and all else. Thus A is at once itself

[18] The phrase is Bradley's. See the essay on *Relations* in his *Collected Essays*.

and transcendent of itself. Accordingly, no quality will be self-sufficient or self-contained; no quality will be self-identical. For a quality will be distinct if, and only in so far as it is differentiated from other moments of becoming. And the relation by virtue of which a quality is differentiated will fall to some extent beyond that moment of immediacy. Yet, at the same time, that differentiation will contribute to constitute that quality. For without that differentiation, the quality A would not be differentiated as it is differentiated, and so would not be the quality it is. Thus we may realize that no quality is self-consistent. Since, for Bradley, being more or less self-consistent is the criterion of being more or less self-coherent or intelligible, the conclusion that no quality is or could be wholly self-consistent or self-coherent means that no quality is wholly intelligible, or self-consistent.

Thus, "we have found that qualities, taken without relations, have no intelligible meaning. Unfortunately, taken together with them, they are equally unintelligible." So far, it has been pointed out that qualities without relations would be undifferentiated, and so would be not many but one. It is impossible, we have noticed, that there might be a plurality of qualities in the absence of relation or differentiation. Yet we have seen that taken together with its relations no quality is wholly self-consistent, or intelligible.

"We may briefly reach the same dilemna from the side of relations. They are nothing intelligible, either with or without their qualities." [19] As relations apart from qualities would be the verbiage of relations without terms, so together with qualities, relations are in no finite context completely intelligible. In order that a relation may differentiate its qualities, a relation must "penetrate and alter" them, and thus be literally implicated in their respective natures. Yet, that this differentiation may not be absorbed into its qualities, it must "fall" to some extent "between" the qualities which it differentiates and thus relates. This is why a relation involves within itself a contrariety: a relation or differentiation is at once implicated in and transcendent of its qualities. And so, —

[19] *Appearance and Reality*, p. 27.

"Again we are hurried off into the eddy of a hopeless process, since we are forced to go on finding relations without end." [20] But, on the other hand, in so far as a relation or differentiation is implicated in its qualities, so far it does not fall between them. In so far as this is the case at any moment in process, a differentiation fails to be a relation at all. Yet in so far as a moment of mediation falls between moments of immediacy, it is outside them both, and thus again it fails to relate them.

So much may suffice to indicate why it is that for Bradley no moment of differentiation may be absolute or self-contained. In any process of fission, no standing distinction between the moments of quality and the moments of differentiation is to be found. There is "a diversity which falls inside each quality. Each has a double character, as both supporting and as being made by the relation." [21] Likewise, each relation has a double character, as both supporting and as being made by its terms. Qualities taken without relations or as absolute, and relations as separate entities, are alike inconceivable, in Bradley's view.

Yet qualities, taken as moments of immediacy that are at once made by and essential to their differentiations, are in no case absolutely self-identical; for qualities are differentiated by their differentiations or relations. And so their respective identities are relational, in Bradley's sense of the term. Likewise, relations taken as moments of differentiation that are at once implicated in and transcendent of their qualities, are in no case absolute relations, for any relation will involve within itself that infinite regress in relational identity that is the principle and content of degrees of truth and reality.

The foregoing statement of Bradley's positive theory of relations, although overly brief, may suffice to indicate why that theory entails the consequence that "identity implies difference." We have noticed above that the identity or character of a quality is what it is by virtue of the relations that differentiate it — that make it the quality it is. And since a quality is *that* quality and no other one by virtue of its differentiations

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[20] *Ibid.*, p. 28.

[21] *Ibid.*, p. 26.

or relations, any alteration in those differentions *ipso facto* is an alteration in the quality they differentiate. For those relations constitute the context which determines the identity of that quality.

We have also noticed that the nature or character of a relation is what it is by virtue of the qualities that are differentiated by that relation. The "infinite process" is reciprocal. Just as qualities are determined by their differentiations to be what respectively they are so those relations are determined to be the differentiations they are by the qualities they differentiate. That is why any alteration in those qualities *ipso facto* alters those qualities.

Now this is held to be true of all qualities, and of all relations, not of only some of either, or of both. Nor is Bradley's position in *Appearance and Reality* at all arbitrary. That all relations are internal everywhere and always follows from the exclusion of external relations in Chapter 2, and the positive doctrine of Chapter 3. Were it suggested that some relations only are internal, whereas some are external, the suggestion would fly in the face of the well-known argument of Chapter 2 of *Appearance and Reality*, to the conclusion that any notion of wholly external relations would be verbiage.

Since the universality of internal relations is categorial, it follows that no limit (in theory) to the differences that differentiate a quality may be prescribed. Any quality is differentiated from all else, not merely from some other appearances. Identity implies difference because where there were no difference there would be no distinction, and therefore nothing distinct from anything else. "I rest my argument upon this, that if there are no differences, there are no qualities, since all must fall into one. But, if there is any difference, then that implies a relation. Without a relation it has no meaning; —." [22] "And this is the point on which all seems to turn. It is possible to think of qualities without thinking of distinct characters." [23] Bradley answers (p. 25) that this is not possible. The distinction or difference here could not be the bare numerical or exis-

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[22] *Appearance and Reality*, p. 42.

[23] *Ibid.*, p. 25.

tential difference of two qualities that would be indiscernibly the same.

We have seen above that, for Bradley, identity implies *qualitative* difference. "All identity then is qualitative in the sense that it all must consist in content and character. There is no sameness of mere existence, for mere existence is a vicious abstraction." [24] "Numerical distinction is not distinction without difference, that once more is senseless...." [25] And, "Without difference in character there can be no distinction, and the opposite would seem to be nonsense.[26] Two indiscernible qualities would be not two, but one. A quality that were not different from all other qualities would be indiscernibly the same as *some* other quality, or qualities. The alternative to this (if there be qualities at all) is that every quality be differentiated from all else.

The same considerations, *mutatis mutandis*, apply to relations. It follows that every quality and every relation is unique. No two qualities, no two relations, can be the same or indiscernible. Were it true that all difference is difference in quality, it would be the case that every quality and every relation is unmatched. The contradictory of this consequence, viz., that *some* qualities and relations are not unique but numerically different merely, is incompatible with Bradley's theory of relations and the consequence it entails; viz., that identity implies qualitative difference. For were there two simple qualities $A_1$ and $A_2$ that differed *solo numero*, there then would be one quality, $A_2$, that did not imply its qualitative difference from all else.

The suggestion that two qualities might be merely numerically different (or qualitatively the same) in one respect (e.g. hue) and qualitatively different in another respect (e.g. saturation), plainly fails to square with the consequence of this theory of relations that all difference is difference in quality. On that consequence every difference would be unique; no quality or relation could be strictly the same as any other one.

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[24] *Ibid.*, p. 527.
[25] *Ibid.*, p. 531.
[26] *Ibid.*, p. 532.

Thus the notion of partial sameness would seem to afford no escape from the consequence that, in Bradley's view, identity implies qualitative difference.

Presumably it is fairly plain that on Bradley's theory of relations no two appearances may be strictly the same. Any two qualities, or any two relations, that were strictly the same in character would be indiscernible in character. Their difference would be numerical or existential merely. And any such state of affairs is ruled out by Bradley's dialectic as "senseless." Since no two appearances may be strictly the same, there may be no resemblances that are exact.

The dialectic of contraries entails the consequence that every quality and relation, however tenuous, is unique. For that reason alone, on the dialectic of contraries, there could be no exact resemblances. For those of us who find such resemblances in our own experiences, the denial of exact resemblances by the dialectic of contraries is sufficient reason for regarding that doctrine as being profoundly suspect.

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# COSMIC NECESSITIES

## I

### Logical and Existential Necessity

A necessary truth is one which cannot be denied without absurdity. The absurdity can be one of two kinds — *logical* or *existential* — having corresponding negations in the form of logical and existential necessary truths.

A logical absurdity is self-contradictory. It results when a term and its negation are conjoined. It is intrinsically impossible; one need not look outside it to know that it is impossible everywhere. It is not because every domain rebuffs it that it is unable to appear in any, but because it cannot attain the status of appearing anywhere at all.

An existential absurdity is not intrinsically impossible. It expresses a conceivable state of affairs. It is not self-contradictory. It can appear; it can be entertained, believed, asserted. It is absurd because its existence or meaning denies what is required in order that it be or have a meaning. It is absurd because it denies the possibility of its own occurrence.

It would be self-contradictory to conjoin the nature of a domain with the negation of what is existentially necessary in that domain. Accordingly, we can transform every existential absurdity into a true logical absurdity by conjoining to it the characterization of the domain which it requires for its being or meaning. It is possible also to derive an existential absurdity from any logical absurdity, by using one term to define the character of subsequent discourse and then attempting to speak of the other term as inside that defined realm. Thus, "a square is a circle" is logically absurd, but "a square is the uncle of a circle" is only existentially absurd. The one is self-contradictory, the other conflicts with the unexpressed fact that mathematics deals with non-living beings and that these cannot have uncles. We can obtain a self-contradiction

by conjoining to the latter proposition this unexpressed truth about mathematics, so as to get some such logical absurdity as, "A circle is the uncle of a square, though neither is living and only the living have uncles." On the other hand, we can obtain an existential absurdity from the self-contradiction, "A square is a circle," by deliberately delimiting our discourse to nought but squares and then asserting, "this is a circle."

There are two kinds of existential absurdity — *definitory* and *essential*. A definitory existential absurdity is one which is absurd only because the assertion conflicts with some alterable decision. "This is a square" is an existential definitory absurdity when we restrict our discourse to circles, either because this is what we are now experiencing, or because we have arbitrarily refused to discourse of anything else. "Squares are uncles of circles" is also a definitory existential absurdity, since its absurdity depends on a tacit definition of mathematics as concerned with figures which are incapable of having the relation of uncle to one another. A change in decision would free both assertions of their absurdity. Even if we were now experiencing a circle, "this is a square" could be acknowledged to be necessarily true of a real world lying beyond the appearing circle; even if we accept the usual definitions in mathematics, "squares are uncles of circles" could still be acknowledged as a necessary truth in, for example, a fictitious world.

It follows that every contingent truth can be converted into a necessary, definitory, existential one by acknowledging the conditions for its occurrence as essential to its being or meaning. Thus, "Jones is walking," under the conditions of present observation, is not merely true but necessarily true so long as I take this observational evidence to define the truth of what I know. Contingent truths are thus definitory necessary truths held apart from that which provide them with their meaning or being; necessary definitory truths are contingent truths united with the conditions which make them possible.

Definitory truths are necessary only because one takes account of some limited domain with respect to which the discourse is to be in consonance. No one of such truths is itself

philosophically important; at most it reveals the nature of a universe of discourse we now happen to insist upon.

Essential truths are important in their own right. They are truths whose denials conflict with the possibility of any kind of discourse, experience, existence, knowledge or value, and thus with the possibility of themselves. They cannot be avoided, as definitory truths may be, by a mere shift in definition, assumption, belief or custom. To deny them is to deny the very conditions which the denial requires in order to be the denial that it is. For example, it is sometimes claimed that the senses always deceive. If the evidence for this is something learned by relying on the senses, the claim is, quite evidently, essentially absurd. We cannot reject the senses without rejecting all evidence, favorable or unfavorable, obtained through the agency of the senses. Since the assertion that the senses always deceive is offered in a sensed world in the form of sensed words to a sensing reader or auditor, "The senses convey some knowledge" is evidently a necessary, essential truth whose denial presupposes the opposite of what that denial says.

It was Kant who brought the attention of the world to the fact that some propositions could be denied only by rejecting the possibility of any experience. Unfortunately, he took experience in a rather narrow sense, supposing for example that it was rigidly determined, in the face of the obtrusive fact that it is chock full of contingencies, surprises, novelties and free activities. He somewhat arbitrarily supposed that there could be only twelve truths whose denials were essentially absurd, though the very definition of such truths compels no restriction to a dozen. And he overlooked in his first Critique what he had to admit in the second and third Critiques — that there were essential truths in ethics and esthetics whose import was in no way modified by the fact that instances of them might not be found in experience.

Experience ought to be acknowledged to be as rich, as fluid and as flexible as the empiricists have made out that it is. We need not subscribe to Kant's architectonic. We can acknowledge essential truths in other domains besides that of experience.

## II

### Formal, Necessary Truths

There are four kinds of essential truths — (a) those that are formal and prescriptive, (b) those that are formal and descriptive, (c) those that are material and prescriptive, and (d) those that are material and descriptive.

a. "Being is multiple," is an essential, formal, and prescriptive truth. All monists and most theologians would deny that it was essential, the former holding that there never can be more than one being, the latter holding that there was a time when there was but one being. Most logicians would deny that the proposition is formal, referring as it does to being, a reality outside the realm of formalisms. And all empiricists would insist that the proposition offers at best a probable description, prescribing nothing. Despite these formidable and reiterated contentions we must, I think, insist that the proposition is essential, formal and prescriptive and that the monists, theologians, logicians and empiricists are so far mistaken.

A denial of the proposition stands over against the proposition, over against its own component parts, over against the speaker and the world in which it occurs. It is thus one of many. We cannot then deny that being is plural without presupposing that it is. Being could be one only so far as the denial of this contention was impossible, and therefore only so far as we also were unable to maintain it. To the extent that it is possible to say that being is one, to that very extent we know it is not one. It might be argued of course that being might be one, but that we were not able to know or affirm the fact. But this contention cannot be maintained. A being not over against and in opposition to others would be completely indeterminate, an empty possibility for real beings. It would be identical, as Hegel saw, with Nothing.

The proposition is formal. The being to which it refers is being in any form, in any realm; it is what is common to every constant, a variable of the greatest possible range.

The proposition is prescriptive. It defines any discourse regarding a supposed single isolated being to be necessarily false. It lays down a condition to which any being anywhere must conform. It does not describe what is the case, but imposes a condition on any candidate for existence in any domain, actual or fictitious.

"Knowledge is other than being" is also essential, prescriptive, formal.

It is essential, for its denial is absurd; to assert it one must treat it as apart from one, as something to-be-known. To deny that knowledge is other than being is thus to commit the essential absurdity of affirming one thing and denying the very condition for making that affirmation. We must always distinguish between knowledge and what knowledge is about. The function of language is not to repeat but to report.

The given proposition is formal. It refers to any kind of knowledge and to any kind of being and relates them as other than one another. It might be argued, however, that the proposition was material, on two grounds. It might be contended that any variable whose scope is restricted by anything other than the structure of the proposition in which it occurs makes the proposition containing it a material one. "Knowledge" is such a restricted variable. Or it might be contended that any proposition containing terms which could not be defined as constructs out of the elements of logic is a material proposition. The first argument is too powerful; it would deny that a geometry, because it deals with points and lines, could really be formal. It would demand that logic deal only with variables that take values which could be anything whatsoever. In contrast, we ought to hold that a proposition is formal if it relates variables in the most abstract possible way, and this is what the given proposition, by means of "other than" does in fact. The second argument is too weak. It rests on the questionable belief that the terms of all formal disciplines are elaborations of the terms of logic. The thesis has never been made plausible to the majority of mathematicians and logicians. It is highly questionable whether there has ever been a single mathematical term which has been properly defined by means

of logical elements alone. And if one were to grant that the thesis has been successfully maintained in some cases, it is quite evident that it has been abandoned in others. The thesis has been presented in its boldest form in the *Principia Mathematica;* but that work cannot define a number as used by mathematicians except by bringing in the extra-formal idea of "typal ambiguity."

Kant's categorical imperative: Act only on that maxim whereby you can at the same time will that it should be a universal law, is also a formal, prescriptive and essential proposition, as can be seen most readily when it is rewritten as: Good men are those whose maxims assume the form of unrestricted universality. Since the proposition relates any good man to any universal maxim by a relation of implication, it is formal in nature. Since it tells us what must be acknowledged as the unavoidable elections of good men and what must be the nature of men whose maxims are not universalizable, it is prescriptive in nature. It is also essentially necessary. To deny it is to offer a truth and to that extent to act as a good man. And it is to offer the truth as that which others are to accept so far as they are good. The denial is thus an illustration of what it is purporting to deny. Kant's categorical imperative in ethics cannot therefore be rejected. But it does not suffice, since there are necessary, *material* truths, both prescriptive and descriptive, which must be acknowledged before an ethics is possible. Kant stated the indispensable conditions to which every ethics must conform — a tremendous advance which is not to be disowned because it is only a step on the way to the final goal of ethical knowledge.

"The beautiful is admirable" is on a par with the other three truths listed — it, too, is formal, prescriptive and essential. It is formal in so far as it treats the beautiful and the admirable as variables and relates them by a formal relation of implication. It is prescriptive, determinative of the attitudes one ought to assume to the beautiful, and of the characteristic to be predicated of that which cannot be admired. That it is essential follows from the fact that its denial is offered as a portrayal of what is so and has therefore the beauty characteristic of any

graspable truth. It is offered for approval to others and thus exhibits in itself the truth that something beautiful is admirable. The denial, in short, presupposes in itself what it purports to deny; it is therefore essentially absurd.

Such propositions as "being is multiple," "knowledge is other than being," "act in consonance with unrestricted rationality," "beauty is admirable," refer to all possible universes and not merely to ours. They do not therefore seem to be genuine philosophic assertions, but rather pre-conditions, general forms to which such assertions must conform. Yet, no one but a philosopher asserts such propositions. They ought to be termed "philosophical" but distinguished from those philosophical truths which pertain to our universe and perhaps to no other. Let us designate those philosophical truths which are essential to every universe, actual or possible, as "preconditional philosophical propositions," and let us use the term "philosophical" without qualification, to refer to those truths which are essential to this universe and may not be essential to any other. The latter will evidently be material, not formal in nature, formal truths serving only to provide the general framework of the material truths which the philosopher is attempting to utter. Accordingly, necessary, formal truths whether *descriptive* or *prescriptive* are preconditional in nature.

b. It is one of the intents of Husserl's philosophy to provide a method by which formal, descriptive, necessary truths could be obtained. I know of no such truth that Husserl's method has laid bare. Nor was Peirce, in his independent phenomenological inquiry, apparently more successful. Perhaps Whitehead's descriptions of the basic properties of extension in his *Process and Reality* come closest to fulfilling the requirement. But it is not evident that Whitehead was successful. The formality and descriptiveness of his account is evident, the necessity is not.

Phenomenology is a significant preconditional philosophical enterprise, but it is still a virgin domain. We could profit from careful convincing phenomenological inquiries in the fields of ontology, epistemology, ethics and esthetics to supplement the truths given above. The Husserlerian method of bracket-

ing, the Peircean dispassionate survey, the Whiteheadean mathematical dissection are not altogether adequate. We can have little hope of getting necessary truths which are purely descriptive and formal in nature. It does not seem that we can do much more in phenomenology than to assume arbitrarily that what we are describing is anything more than what happens for the moment and for us to be so and so.

## III

### Material, Necessary Truths

Philosophy discourses of this universe. Its truths therefore are material. Since to deny what it says is to deny the possibility of the denial itself, its truths must also be essential and necessary.

Of necessary, material truths some (c) are prescriptive, others (d) descriptive. It is these two types that are left for us to examine.

c. "No existent can be completely perfect" is a material truth, saying something of the substantial nature of things in this universe. It is a necessary truth, as true yesterday as it will be tomorrow, as true in Brazil as it is in Spain, true in the laboratory no less than it is on the street. It underscores the fact of conflict and of change, the limitation in the power and influence of each particular thing, for these are characteristic of what is imperfect. To deny that "no existent can be completely perfect" is to deny the necessary existence of a plurality of beings, each limiting and being limited by the rest. Such a denial rejects its own possibility, for it stands over against its own contradictory, its component parts, its speaker and the world in which it occurs and thus exists only as an imperfect entity, limiting and being limited by other imperfect beings. Only a single, undivided totality, exhaustive of all reality, could be absolutely perfect. Were there such a perfect being, it could not be known; for to know is to stand apart from what is known and thus to be less than all there is. The assertion that absolute perfection exists destroys its own ground.

Were the given proposition descriptive, it would isolate some characteristic which everything does and perhaps ought

to possess. Were it prescriptive it would specify a characteristic which all ought and may possess. Since the proposition lays down a condition to which all beings must submit if they are to be part of our universe of thought or fact, it must be prescriptive rather than descriptive in nature. Without having to survey and describe the whole of reality, we know that no being ever was or will be perfect in it. Of all conceivable candidates for existence, one kind we know therefore cannot exist — a God or Absolute, if these are thought to be exhaustive of all reality. We have here an ontological argument for the non-existence of Anselm's God or Hegel's Absolute. Of all possibilities these alone cannot exist. Or, to put it another way, the ontological argument is valid so far as it concludes from the possibility to the existence of a number of unspecified existent beings. Existence demands of possibilities that they be realized in groups. To exist is to exist over against, to be one of many.

There is a similar material, prescriptive, necessary truth in the theory of knowledge: "No actuality can be exhaustively known." The proposition is necessary, for if an actuality could be exhaustively known, there would be no difference between knowing and being, and knowledge would cease to be "knowledge of" and thus knowledge at all. The proposition is prescriptive, determinative of the nature of those things which can have the status of being actual. That the proposition is material as well, is evident if one contrasts it with its counterpart — the formal, prescriptive, necessary truth discussed above: "knowledge is other than being." The latter refers to an irreducible logical difference between any possible item of knowledge and any possible being; the former tells us a material fact about real beings and real knowledge.

A consequence of the foregoing is the truth "I am and always will be ignorant." This is an essential truth. For an empiricist, however, it can be nothing more than a definitory or a contingent one. He must allow that, on his principles, there is some degree of probability that he might be omniscient tomorrow. He illustrates in a new way how an excess of modesty is but a disguise for arrogance and dogmatism. One would be more modest by not being so modest — and one would

be more correct. No man can be omniscient. Knowledge involves the distinction and unification of elements to constitute a judgment; that judgment has the status of an item of knowledge only as standing over against a being in which the distinguished elements of the judgment are one and undivided. Knowledge of a table involves judging "this is a table" and referring and contrasting that judgment with the table as a "this" and "a-table", one and undivided. To know is to acknowledge a real being as the counterpart of a judged articulation of it; it is to confront the judgment of a being with the being which the judgment purports to be about.

Similar material, prescriptive, necessary propositions are to be found in ethics and esthetics. Both of these are normative sciences, enunciating prescriptive truths. Both of them assert prescriptive truths that must hold of all men everywhere. And since those truths refer to actual men engaged in acts which are actually right or wrong, monotonous or creative, and which terminate in what is good or bad, beautiful or ugly, they are truths which are material rather than formal in nature.

"It is absolutely wrong to reduce the value of anything" is prescriptive, dictating what acts ought to be and what ought not to be approved or performed. It is material, referring to men confronting real things in this universe. It is also necessarily true. To deny it is to assert that it might be right or at least indifferent if the values of some things were reduced. The denial makes sense only if it be understood to mean that the reduction of value does not involve the impoverishment of any being. This would be possible if value were an adventitious accident whose removal affects nothing. But this cannot be maintained.

To suppose that values were adventitious would be to suppose that they were irrelevant accompaniments of things. They would not be values *of*, but only values *for* them, and thus would be value-predicates, not values. Only if such value-predicates could somehow bring about relations or wholes which were in fact valuable, would there be values which could be destroyed. But those values would not be irrelevancies; they would be those relations or wholes as possessing some degree

of excellence. To reduce a value is to change a *being* so that it is less good, has less worth than it could have.

It is better for the good to exist than for it not to exist, to be concrete and determinate than for it to be a bare indeterminate possibility, for as existential the good is made effective and capable of being endlessly multiplied. A reduction in value is the conversion of some value as determinate and concrete into a value which is indeterminate and abstract. Were the destruction of things good, the more indeterminate things were, the better they would be. If such destruction were indifferent, there would be no value either in what was determinate or in what was indeterminate. There would be therefore no value anywhere.

"The indeterminate is not less good and may be better than the determinate" is thus a way of stating a negation of our initial proposition. But it has the status of such a negation only so far as it is determinate, determinately rejecting a supposed determinate falsehood. If what is said were correct, there would be no loss and there might be a gain in value were it less determinate and thus if what it said were not exact, or if it were a possible and not a real denial. The very reality of the denial shows that what it says could not possibly be true. It is only because it exists as a determinate entity that it can offer itself as a desirable alternative to the given proposition.

d. A descriptive truth discourses of things directly, isolating some feature which they in fact possess. It is formal or material depending on whether or not the characters to which it refers are abstract structures, possibilities, rather than substantial, specific beings. It is necessary, and essentially so, if everything, including its denial, in order to have being or meaning, presupposes its truth.

"Each being is unique" is one such truth. It is evidently not prescriptive, for it does not classify or evaluate but instead speaks directly of the nature that beings have. It is evidently a material truth, since it discourses of what actually exists in our universe. What is not immediately evident is that it is necessarily true.

The denial of the given proposition is: "Some beings are not unique." If the denial were warranted, some beings would

be duplicatable. It would be possible to have two of them which differed in no way whatsoever except in that they were two. But they could not be two except so far as they were different in some respect, say in location, in function, in appearance, etc. But then those locations, functions, appearances, etc., could themselves not be duplicatable, for otherwise they would not suffice to distinguish the two beings. It is possible to maintain that two beings could be merely numerically diverse only if one denied being to the points of space and time, to functions and appearances, and yet affirmed that these non-beings sufficed to distinguish two beings, which in every other sense were identical. One would thereby be maintaining that the numerical diversity of beings was an extraneous fact about them. But then the beings would not really *be* two.

"Some beings are not unique" is expressed by an individual in an individual way; it is a denial which occurs on an unduplicatable occasion. If it were true there would be some duplicatable being. Such a being standing over against an individual speaker on a unique occasion would, as in that context, be unduplicatable. One tiny little unique being off in the corner of the cosmos would make all other things absolutely unique, were they not — as they are — unique on their own account.

We are now perilously close to nominalism with its disastrous conclusion that there are no universals, no concepts, no propositions and therefore no theory of nominalism. But — and this brings us to another necessary, descriptive, material truth — though every characteristic and expression is individual because infected and sustained by an individual, one can, by convergent individual acts of abstraction, obtain a single result from those different individuals. What are termed 'repeated instances of universals' are individual cases from which, by individual acts, a common terminus in the form of a singular, indeterminate possibility, can be obtained.

"All knowledge is abstract" is a similar truth. It describes a character of knowledge, and is thus descriptive. Referring as it does to acts of human knowledge, it is material. That it is necessary is evident from the fact that it specifies the formal necessary truth "knowledge is other than being" by explicitly

characterizing knowledge as abstract and implicitly characterizing being as concrete. In brief, it states the particular way in which knowledge is other than being.

It is possible to deny that "all knowledge is abstract." The denial would be true in a realm where objects were abstract and knowledge was a vital possession of objects by beings more concrete. The denial is absurd because it is offered as an instance of knowledge in this universe, and thus as itself something abstract, communicable, something less substantial than the knowledge of which it discourses. All our discourse presupposes a world more concrete, and the denial therefore cannot exist except so far as it is false.

"Every being has value" is likewise material, descriptive and necessary. It is material, for it speaks of the beings in this world in non-formal terms. It is descriptive, referring to some trait they all possess. It is also necessary. He who rejects it as something false, or not proven, reveals in his attitude and effort his acknowledgment of the value of truth. Now whatever exists in a world where one relevant being is valuable has value of some kind, for it excludes and qualifies and may sometimes abet or conflict with the valuable being — and most important, will in its own way illustrate such value-traits as unity, existence, power and order. Because the denial has value of some kind, the beings of which it discourses must have value too, for they are the denial in a more determinate form. And whatever else exists with those objects will have value too, excluded and excluding, existing and unified just as they are. The things which the denial presupposes have a value which the denial absurdly denies they have.

## IV

### A Method

A good deal of what is here urged will appear to be obscure, even after the novelty of the statements has been worn away. Part of the reason for that obscurity is the fact that the truths on which we have fastened — and particularly the material, philosophically necessary truths — have a greater

reach than those in which we are daily interested and do not therefore have the translucence characteristic of what is at the focus of attention. The truths seem to be pulled out of nowhere. There is no indication as to just why these should have been chosen. There is no indication of how another might himself find these or similar truths. A method is needed for obtaining philosophic truths. It must begin with what is familiar or available to everyone and move with surety to the material necessities on which philosophy pins its hope and makes a claim to being sensible.

A philosophy can begin with any empirical truth whatsoever. There is none too trivial to serve as a starting point. It can begin with "This is yellow" or "My cat likes milk," with "I read fairy tales when a child," or "It rarely snows in Los Angeles." If we tried to start elsewhere we would be forced to begin with some specially favored common sense truth or go outside the range of common sense. In either case we would actually start with common truths but make explicit only the result of moving from them by means of a principle of selection or a method of going beyond them. A philosophy ought to begin where the philosopher actually begins, and thus with the truths he knows every day.

Different empirical truths stress different phases of existence or knowledge. The first of the above propositions is concerned with a fact of perception, the second provides an interpretation of a number of perceived responses which the cat makes to milk, the third is based on a report of memory and the fourth on descriptions and accounts of others. No one of them is exclusively a perception, an interpretation, a memory report or a description, but their difference in stress is so marked as to justify their classification as different types of assertion.

The first task of the philosopher is to identify out of the host of truths he knows those which stress that phase of existence or knowledge with which he is concerned, and turn these into necessary truths by relating them to their bases, to the reality of which they are the articulations. Every truth can be shown to be necessarily true, but only a few of them are such that their denial is tantamount to a denial of the possi-

bility of discourse, speech or life. "It is wrong wantonly to kill my friend" has this merit. It is not a truth which merely happens to be embraced by all men because they happen to have adopted some voidable base; it is a truth on which they must agree because the base which makes it necessary is inseparable from their individual beings.

Though all men have a direct acquaintance with a base which cannot be voided without losing sanity and coherence, and though it lies behind every voidable base as more general and permanent, it is hard to focus on. Unless one has the gift or good fortune to isolate truths which rest directly on the unavoidable base one must be content to look forward to them as the fruit of a long and exclusive devotion to philosophic study. Philosophers are usually gray by the time they are able to see and say clearly what it is that every one already vaguely knows.

It is not necessary for a philosopher to start with truths which refer directly to an inescapable base, though if he can start off with such truths he can proceed with greater despatch than otherwise. In their absence and as a check on them it is desirable to move from the stage of identification to the stage of generalization. Generalization is the process of taking an empirical truth and eliminating the different specific constants in it so as to free the whole from arbitrary limitation. "I opened the door to get here" loses nothing of its truth when generalized to "somebody did something to achieve something else," or more boldly, to "an effect follows on a cause." And we can generalize, "It is wrong wantonly to kill my friend" to "It is wrong to destroy wantonly," or more boldly, to "It is wrong to minimize value."

By generalizing, something of the obtrusiveness, concreteness and significance of the original is lost, but the truth is preserved in a simplified form. Because the generalization frees the truth from arbitrary limits it is one which has a more direct bearing on the inescapable base than the truths from which it was obtained.

A philosophical truth is a general truth which is inseparable from an unavoidable base. The higher up one goes in a

process of generalization the more surely one isolates truths which cannot be denied without absurdity.

A generalization is obtained by transcending the limitations expressed in a particular instance. It may be highly abstract — a form emptied of specific content. Every generalization, however, also has an exemplification. It expresses not merely the form which a particular case illustrates but the nature of a domain of existence or knowledge which specific things and bits of knowledge fill out in fact. "An effect follows on its cause" is a generalization exemplified as the temporal structure in which all actions occur; "it is wrong to destroy anything of value" is a generalization exemplified as the structure relating values and an absolute right.

The more superficial the truth which one accepts at the beginning and the more ultimate the field with which one is concerned, the more often must the process of identification, generalization and exemplification be repeated. If we accept, for example, nothing more than the fact a book is on the table, or that I am sitting at my desk, we are forced to repeat the process many times before we can reach such a basic truth as that all beings endeavor, in partly opposing ways, to become more and more complete.

Philosophy is the art of destroying the habit which keeps thought inside bounds having no greater warrant than convention and tradition. But no man can so purify himself that he does not in the end reveal the grip his time and his fellows exert. The boldest and freest of spirits are all creatures of their day. The philosopher must attempt to become completely free of the unnecessary bonds which hem man in, but he can hope only to become freer than he was. The degree of his freedom is measured by the extent to which he can repeat the threefold process and end with an exemplification which is broader and at least as concrete as the exemplifications with which he had been concerned before.

The purpose of the philosopher is to know the world in which he lives in a stable illuminating way. His beginning, end, and method reflect his sense of what is important; they reveal something of his sense of values. Philosophy is neces-

sary truth cutting the universe at its proper joints; but it is also, and to the very same degree, biography, exposing the character of him who is intent on revealing what lies about him. We can know the nature of philosophy's beginning, the method it must use and the kind of results at which it should arrive. But the movement of philosophy, the enterprise itself, requires a man who makes himself when and as he finds the world, and shows us himself when and as he tells us what he finds. Philosophy is the adventure of a free spirit in pursuit of cosmic necessities.

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# REICHENBACH'S THEORY OF PROBABILITY AND INDUCTION

We can best begin a discussion of probability and induction by asking: What are some philosophical problems of induction? Historically, a number of different problems have been attacked under the name "induction" and it was not until this century that they were clearly distinguished. We have first to differentiate (as Bacon and Mill did not) between the problem of finding a useful method for science (i.e., a procedure for discovering important empirical relations and laws) and problems about the nature of inductive arguments. In the latter case the argument is taken as given, conclusion (result) as well as premise (evidence), and there is no question of inventing a useful hypothesis for which the given data can serve as evidence. In actual scientific practice the discovery of hypotheses and the use of inductive arguments are intertwined, but for explanatory purposes these two aspects of scientific procedure should be kept separate.

But even with respect to inductive arguments (as contrasted with rules of discovery) there are a number of different philosophical problems. One is to make explicit the fundamental or most general pattern or patterns of inductive argument. (Some such qualifying word as "fundamental" is needed here because the main business of the theoretical statistician is to develop and apply patterns of inductive inference.) Once these patterns are known a second and third problem arise. The second is to justify (or show that it is in some sense impossible to justify) man's use of and faith in inductive arguments. And the third is to formulate some general propositions about nature (e.g., the uniformity of nature) which could reasonably be accepted by users of inductive arguments and which when added to the premises of these arguments make them explicitly deductive.

In his recent work on the theory of probability Professor Hans Reichenbach [1] deals with the first two problems but not with the third. Briefly, he finds that statistical induction by enumeration is the basic pattern of induction (pp. viii, 361) and believes he has given a satisfactory pragmatic justification of its use (pp. viii, 475). Under these circumstances it is quite natural that this third problem should not concern him (cf. p. 473); but for one who agrees with Hume that no justification of induction is possible it is an important problem.

We should like in this paper to examine carefully Professor Reichenbach's analysis and purported justification of induction by enumeration. But let us first give detailed consideration to yet another problem of induction. Everyone would agree that one or more concepts of probability play an essential role in any pattern of inductive argument. It is therefore impossible to treat these other problems of induction apart from a theory of the interpretation and application of the calculus of probability. We turn, then, to our fourth problem of induction, that of the nature of probability.

The basic questions about probability relevant to induction are two, and we can best approach Reichenbach's position by considering his answers to them. (1) How do we verify or establish *primary* probability judgments? Any

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[1] *The Theory of Probability*, University of California Press, Berkeley, 1949. All page references are to this work. This is an English translation (by Ernest H. Hutten and Maria Reichenbach) of his earlier *Wahrscheinlichkeitslehre*. It is called the second edition since it is a revised and augmented version of the original German text.

This was, and still is, a very important book in the theory of probability and induction, and it is desirable that it should reach a wide audience. Moreover, Reichenbach has revised it in the light of criticisms made by advocates of opposing theories, so that we have here a good contemporary formulation of one of the main theories of probability — the frequency theory.

It is interesting that Reichenbach did not believe it necessary to modify his theory in any fundamental respect (p. vii), the most important change being a shift to a finite frequency conception of probability with regard to primitive inductions. This is all the more noteworthy when we consider that in recent years the frequency theory of probability has been steadily declining in popularity among philosophers.

attempt to answer this question leads naturally to the semantic question: (2) What is the meaning (or meanings) of "probable"? The occurrence of "primary" in the first question requires comment. It is the function of a calculus of probability to enable one to compute the probability of compound cases from the probabilities of their elements. Now the development of probability calculi belongs to mathematics and logic. Philosophical problems arise with respect to *primary* probability propositions, so that question (1) must be restricted to this case. Indeed, all writers agree on the essential theorems of probability, and where they disagree (as, for example, on the question: Does a probability of 1 imply deducibility?) their disagreements can be traced to the different answers they give to questions (1) and (2). It is for this reason that the philosopher is interested in finding the fundamental pattern of inductive argument; once this is given the others can be generated from it by means of the calculus of probability. To put the matter in Reichenbach's terminology, the main philosophical problems have to do with "primitive knowledge." Given an explanation of primitive knowledge, "advanced knowledge" is then explained by means of the calculus of probability (pp. 364-5).

Reichenbach's answer to the first of these two questions is simple and straightforward: he tells us that primary probability sentences are verified empirically or *a posteriori*, by the observation of frequencies (p. 359). In contrast, his answer to the second question is complex. We shall devote the next few paragraphs to an examination of it.

It is a thesis of his book that "the frequency interpretation of probability can be carried through for all uses of the term 'probable'" (p. vii). "Probable" is here defined in terms of "limit" and "relative frequency":

> *If for a sequence pair $x_iy_i$ the relative frequency $F^n(A,B)$ goes toward a limit p for $n \to \infty$, the limit p is called the probability from A to B within the sequence pair* (p. 69).

This is, of course, only a formal definition, capable of being applied in all sorts of ways (e.g., to possible universes as well as to actual events); so we must look to the semantic interpretation Reichenbach places on the terms in the *definiens*

before we have the meaning. Here he holds that there are two different meanings of "probable":

> In the first usage the word "probability" refers to *sequences of events* or of other physical objects; ... In the second usage, however, the term "probability" is applied to *single events* or other single physical objects; ... (p. 338).

We shall consider only the former meaning, since the latter meaning is explained in terms of it (it is maintained that when "probable" is used to refer to a single case there is an elliptical reference to a sequence — p. 377).

At this point frequency theories have traditionally run into a serious difficulty. Given the general frequentist viewpoint that probability has to do with the frequency of the occurrence of properties in objective sequences, and given a formal definition of the sort quoted above, the natural way of answering the question *What is the meaning of "probability" (as applied to sequences)?* is to say that in the above definition "A" and "B" are to be assigned as values predicates that determine classes of actually existing things or events and that "$x_i y_i$" is to be dealt with similarly. The difficulty is that such an answer comes in conflict with the frequentist's answer to the first question (i.e., the assertion that primary probability judgments are empirical); for although finite, relative frequencies are directly observable, assertions involving the concept of a limit in an infinite sequence cannot be directly verified. One could, of course, treat such assertions as theories, to be verified indirectly in terms of their consequences. But since indirect verification is a form of inductive inference, this leads to an infinite regress: the inductive argument employed to substantiate an indirect verification will contain a probability assertion, and the same question will arise again, namely, How is this proposition verified?

Professor Reichenbach is aware of this difficulty and to resolve it adopts a finite frequency theory of probability: "probability" as applied to sequences of events and used in primary probability sentences turns out to mean just relative frequency.

> A distinction is made between primitive knowledge and advanced knowledge, and the problems of induction and of the meaning of

> limit statements are given different treatments for the two cases. In advanced knowledge, which presupposes the use of previous inductions, both the inductive inference and the meaning of limit statements can be accounted for in terms of probability concepts. In primitive knowledge, which does not make use of previous inductions, the meaning of limit statements can be defined by the help of a "finitization," which eliminates infinite sequences; the use of infinite sequences then appears as a simplification introduced for technical reasons. The inductive inference, as far as it is applied in primitive knowledge, is made legitimate by my justification of induction (p. x; cf. pp. 347-9, 382, 447-8).

The use of the limit definition of "probable" with respect to advanced knowledge does not give rise to the difficulty discussed in the previous paragraph, of course, since indirect inference is a legitimate operation once we can presuppose the possibility of verifying primary probability propositions (primitive knowledge).

In a work devoted to the logical foundations of probability one would expect to find a calculus for this finitistic frequency theory of probability. This is not the case here, however: the formalism which Professor Reichenbach develops to explicate the concept of probability (the definition and axioms) is based on the non-finitistic, limit conception of probability. As he himself points out (p. 348), not all of the axioms (in particular, those dealing with order in sequences) hold strictly for finite sequences. He believes it possible to reconstruct the calculus of probability so that it does strictly apply to finite sequences, but because such a calculus would be more complicated and unwieldy than the calculus he presents he prefers to use the latter. Now it may well be that one can develop a calculus for a finite frequency theory of probability as adequate for the analysis of induction as the calculi ordinarily used by frequentists for this purpose, but Professor Reichenbach has neither shown this to be the case nor given any convincing reason to believe it so. He argues that his procedure here is unobjectionable because it is the normal scientific process of using idealizations (concepts of perfect

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[2] In this respect his position is now different from what it was in the original German edition of the book; indeed, this constitutes the chief change of philosophical importance in the English (second) edition.

points, lines, exact derivatives, space of zero curvature, etc.). While there can be no doubt of the legitimacy of the scientific practice of using idealizations — and this is even true of many of the uses of the theory of probability (e.g., in genetic theories concerning the occurrences of genes in a sequence of generations) — one can equally well remark that there is no doubt of the legitimacy of the scientist's employment of induction. There may be a problem of justifying the scientist's procedure here, but if so it is a philosophical problem, not a scientific one. These observations are not unconnected, for it may be that the use of idealizations does in fact presuppose induction, in that theories involving them are verified indirectly, i.e., by the direct verification of their consequences; we have already seen that this is so with regard to the idealized concept of probability defined in terms of limit in an infinite sequence. Hence while it is satisfactory for the scientist to use idealizations, it is by no means clear that it is acceptable for the philosopher to use this particular idealization concerning probability in his analysis of the fundamental pattern of inductive inference. We may note, in conclusion, that Professor Reichenbach's well-known rule of induction is in fact formulated in terms of the limit concept of probability, not the finite one.

We return now to the question: What are the meanings of "probable"? Reichenbach's answer is that there are essentially three: probability as used in the single case, probability defined in terms of the limit of a frequency in an infinite sequence, and probability defined in terms of the relative frequency of one property with respect to another in a finite sequence. The important point at this juncture is that in primary probability assertions "probable" is to be understood in the last of these three senses, and that it is on this basis that it is claimed that primary probability sentences are empirically verifiable. Now empirical verification is of course inductive verification; so we must consider next what Reichenbach regards as the fundamental pattern of inductive inference to see in greater detail how this verification is accomplished.

Reichenbach stands in the Humean tradition, holding that the basic form of induction is induction by enumeration, broadened so as to cover statistical assertions as well as

universal ones (pp. 364, 433). His rule of induction is formulated as follows:

> *If an initial section of n elements of a sequence $x_i$ is given, resulting in the frequency $f^n$, and if, furthermore, nothing is known about the probability of the second level for the occurrence of a certain limit p, we posit that the frequency $f^i$ $(i > n)$ will approach a limit p within $f^n \pm \delta$ when the sequence is continued.* (p. 446)

Some parts of this rule require explanation. When one is concerned with establishing primary probability judgments nothing is given about the probability of the second level: therefore we may ignore this qualification in our discussions. Also, in primitive knowledge "probable" is used in the finite frequency sense. Since this use of "probable" does not involve the mathematical conception of limit, "limit" should be replaced throughout by "practical limit" (p. 447), where this term is defined by the following sentences:

> I will introduce the term *practical limit* for sequences that, in dimensions accessible to human observation, converge sufficiently and remain within the interval of convergence (p. 347).
>
> A sequence that converges so late that human observers cannot experience the convergence has, for all practical purposes, the character of a sequence without a limit (pp. 447-8).

It is significant that "practical limit" has none of the precision characteristic of the concept of "limit" that is employed in the formal theory of probability developed in this book.

Note that what we have here is not a pattern of argument in the strict sense, for we are not permitted under the rule of induction to conclude "*Therefore probably* the frequency $f^i$ $(i > n)$ will approach a limit $p$ within $f^n \pm \delta$ when the sequence is concluded." The rule merely permits us to act on the assumption that the sequence does in fact have this character.

> *A posit is a statement with which we deal as true, although the truth value is unknown* (p. 373).

Now there is no doubt that scientists do draw tentative conclusions and revise them in the light of further evidence; scientific method is self-corrective, as both Peirce and Reichenbach have rightly emphasized (p. 446). But it is equally true that scientists (and the common man) do in fact conclude their inductive arguments with "It is probable that . . .," used in a

declarative sense. Certainly Reichenbach is aware of this fact. Why, then, does he not frame a basic rule of induction which allows us to draw a conclusion with probability? The answer is that he believes that the use of any pattern of inductive argument in which the conclusion is asserted with a degree of probability cannot be justified, but that the use of the weaker rule of induction which he has formulated can be (p. 473). In other words, Reichenbach's reason for choosing the rule of induction as fundamental, rather than a stronger pattern of inductive inference, is that he believes on the one hand that it is sufficiently strong for all other valid forms of inductive inference (in particular, the indirect verification of a theory via the direct verification of its consequences) to be reduced to it by means of the calculus of probability; and on the other hand that it is sufficiently weak for its use to be justified and hence for the claim, that primary probability sentences are empirically verifiable, to be validated. Thus it would seem that the entire empiricistic philosophical position of this book hinges on the success of Reichenbach's attempted justification of induction. Let us turn to this next.

The aim of Reichenbach's justification of induction is to give some reason for men to employ his rule of induction, i.e., to show that it is reasonable to choose it as an instrument or means to the end of successful prediction. The argument is divided into two steps. The first attempts to show that the use of the rule is justified if we make the assumption that the sequences on which it is used have a limit of frequency. Since on the finite frequency interpretation of probability the reference here must be to practical limits, this assumption is a form of the traditional uniformity of nature postulate (p. 473). Hence this step would be readily granted by the most ardent Humean and need not detain us. The crucial step is the next one: to show that the uniformity of nature need not be postulated. Reichenbach does not attempt to show that it is true, or even that there is a finite probability that it is true; he recognizes that Hume showed the impossibility of this (p. 473). He wants only to show that it is reasonable to act as if it were true. His justification of induction is summarized by the following thesis:

> *The rule of induction is justified as an instrument of positing because it is a method of which we know that if it is possible to make statements about the future we shall find them by means of this method* (p. 475).

The detailed justification of this thesis is sufficiently important to warrant extended quotation:

> We used the assumption of the existence of a limit of the frequency in order to prove that, if no probabilities are known, the anticipative posit is the best posit because it leads to success in a finite number of steps. With respect to the individual act of positing, however, the limit assumption does not supply any sort of information. The posit may be wrong, and we can only say that if it turns out to be wrong we are willing to correct it and to try again. But if the limit assumption is dispensable for every individual posit, it can be omitted for the method of positing as a whole. The omission is required because we have no proof for the assumption. But the absence of proof does not mean that *we know that there is no limit;* it means only that *we do not know whether there is a limit.* In that case we have as much reason to try a posit as in the case that the existence of a limit is known; for, if a limit of the frequency exists, we shall find it by the inductive method if only the acts of positing are continued sufficiently. Inductive positing in the sense of a trial-and-error method is justified so long as it is not known that the attempt is hopeless, that there is no limit of the frequency. Should we have no success, the positing was useless; but why not take our chance? (p. 473)
>
> In positing according to the rule of induction, always correcting the posit when additional observation shows different results, we prepare everything so that if there is a limit of the frequency we shall find it. If there is none, we shall certainly not find one — but then all other methods will break down also (p. 475).

Despite the convincing quality of these passages, it seems to this writer that Reichenbach has not in fact given any good reason for acting in accordance with his rule of induction.

In the first place, to justify a choice of a course of action we need to adduce reasons to believe that its *expectation value* is at least as great as that of any alternative course of action. (The expectation value of a course of action is found by considering each of the alternative outcomes in turn and multiplying the probability of its occurrence by some measure of value or utility — positive or negative — that will accrue if it occurs; and finally, summing all of these products.) The

entire development of modern probability and utility theory shows that expectation value should be the criterion of justified action; and it doesn't seem to this writer to be the case that one would be willing to regard the choice of one course of action as against others justified unless he were also willing, on reflection, to admit that it had an expectation value at least as great as the expectation value of any of the others. Now Reichenbach does not claim to have established any reason for believing that the expectation value for the course of action advised by his rule of induction is as large as any of the expectation values for alternative choices of behavior. Hence it would seem that he has not established the essential point involved in justifying a course of action.

Perhaps it should be required in addition that a justification of a course of action include evidence that not all of the expectation values of the possible courses of action are zero. Suppose someone should make a plausible case for the following theses: That there are an infinite number of possible predictive procedures open to man each with a zero probability of success; that all of the possible outcomes of all the possible choices eventuate in a finite amount of value for any one man (cf. Pascal's wager), and hence that there are an infinite number of available predictive procedures each with an expectation value of zero. Now I seriously doubt that we should regard this person as having given a justification of the use of any one of these procedures, even though the probability of zero does not, on the frequency theory, preclude success, and even though any one of these procedures does in fact have an expectation value as large as that of any other. This is perhaps a personal matter, but I for one should not think any course of action justified under these circumstances. This writer would therefore hold that to justify a course of action one must show not only that it has at least as great an expectation value as any alternative course of action available, but also that not all the expectation values are zero.

It is significant that the choices mentioned by Reichenbach as analogous to the inductive choice do satisfy this stronger criterion of justification. Consider, for example, the concluding paragraph of the book:

> A blind man who has lost his way in the mountains feels a trail with his stick. He does not know where the path will lead him, or whether it may take him so close to the edge of a precipice that he will be plunged into the abyss. Yet he follows the path, groping his way step by step: for if there is any possibility of getting out of the wilderness, it is by feeling his way along the path. As blind men we face the future: but we feel a path. And we know: if we can find a way through the future it is by feeling our way along this path (p. 482).

It seems clear that there is a finite probability that the path found by the blind man will lead him out of the wilderness, and that under the circumstances the choice of following it has an expectation value greater than those of the alternative courses of action open to him. Thus the essential feature of the analogy has not been established, since no attempt has been made to show that the choice of the rule of induction satisfies the criterion of justification mentioned above. The conclusion is, then, that the use of the inductive method cannot be justified without showing something about its expectation value. (From this conclusion and from the definition of "expectation value" it follows that the use of the inductive method cannot be justified without showing something about the *probability* of its success.)

Since alternative choices of method must be considered in any justification of induction, it will be helpful to compare *the standard inductive method* (a procedure in accord with Professor Reichenbach's rule of induction or a closely similar rule) with another method, which we shall call *the random predictive method*. Any scientific procedure involves two parts, *the descriptive part* (collecting and correlating data) and *the predictive part* (making predictions). The random predictive method is the same as the standard inductive method as far as its descriptive part is concerned, but differs with respect to its predictive part. Instead of extrapolating past uniformities into the future, a practitioner of the random predictive method makes each prediction about the next element of the sequence at random, and so bases his actions and expectations on predictions unaffected by past data.

The random predictive method is an unreasonable method, introduced only for comparative purposes, but it is important

to keep in mind that it cannot be shown to be unreasonable without an implicit appeal to some uniformity or limit postulate. The *devil's advocate* of this method would maintain that the successive states of the universe are determined independently of one another, as if each state were created by picking qualities at random from a cosmic grab-bag independently of what had been picked at any prior time. Hence on his view a proposition which asserts any kind of causal connectedness between successive states of the universe, that is, any basis for using the past as a guide to the future (such as the uniformity postulate), will have an antecedent probability of zero. In the light of this it is easy to see how the devil's advocate would explain the actual uniformity and apparent non-independence of the successive states of the universe observed in the past. He would say that this shows no more than that the extremely improbable may happen. Since any uniformity of nature postulate had, according to him, an antecedent probability of zero before any of this evidence was available, by Bayes' theorem of inverse probabilities its probability relative to all the evidence about the past is still zero. Thus he views the actual past of the universe as a gigantic cosmic accident. In brief, the devil's advocate would say: "I've had an extremely long run of bad luck, but tomorrow my luck will probably be better."

The devil's advocate would also question the assumption of the reliability of memory and records about the past presupposed by the claim that we have probable knowledge that the past does in fact have a certain character. This brings us to our second criticism of Professor Reichenbach's justification of induction. The entire argument proceeds on the assumption that we have probable knowledge of the past of a sequence, that is, of the $f^n$ mentioned in the rule of induction. But surely a sceptic would question this assumption. Hume started with what he believed to be reliable knowledge, the immediate knowledge of the present, and then employed his scepticism in all directions: on the past as well as on the future and on transcendent metaphysical entities.

Let us next compare the random predictive method with the standard inductive method from the point of view of Professor Reichenbach's justification of induction. The first

question to ask here is: Does the posit mentioned in the rule of induction refer to the character of an infinite sequence or a finite one? It would seem that on the finite frequency theory and at the level of primitive knowledge it must refer to a finite sequence. But then Professor Reichenbach's justification of induction applies to the random predictive method too, for when the end of the finite sequence referred to in any given posit is reached the predictive parts of the two methods will be irrelevant and the results of the descriptive parts will certainly agree. In other words, if the sequence to which the random predictive method is applied converges to a practical limit, this method will find it. It is not clear that Professor Reichenbach would deny this (cf. p. 447). But surely a justification of induction which works for the random predictive method is no justification at all.

It is easy to see why we do regard the standard inductive method as the better of the two. We do so because we believe it will *probably* have a greater day-by-day success, where day-by-day success is measured by comparing the individual probability predictions with the corresponding outcomes over a *finite* period. Thus the criterion of ultimate convergence is too broad — we must take account of the likelihood of success during some finite span we are interested in. Note that in the light of this criterion it simply is not true to say that if there is no limit to the sequence under investigation, no method can succeed. Of course, if there is no limit, then no method can find it; but a method of prediction might nevertheless atttain a good deal of success over some finite period. Hence the standard inductive method is not the only one that might bring success, so to justify its use we must give reasons for believing it preferable to the alternatives from the point of view of *day-by-day* success. The devil's advocate would argue that the probable success of the random predictive method is as great or greater than that of the standard inductive method, and that the former is preferable to the latter since we need not study the past to make predictions as good as it is possible to make.

The conclusion reached in the last paragraph — that the probable success of an inductive method over *finite* ranges is

the important criterion of justification — holds even if we take the posit mentioned in the rule of induction to refer to the limit of an infinite sequence, i.e., even on the limit frequency theory of probability. On this interpretation the standard inductive method will converge on the limit (if there is one) while the random predictive method will not. But this is not a significant difference. For in the absence of any assumption about the relation of the observed part of the sequence to the whole, we will never have the slightest reason to believe that any given posit does in fact correspond to this limit. Nothing about the limit of an infinite sequence follows logically from information about a finite portion of this sequence, and nothing follows with probability apart from some assumption about the whole sequence. We have here the same difficulty that was mentioned earlier in connection with a non-finitistic theory of probability: on this theory a posit concerning the limit of an infinite sequence could never be verified to any degree. There is thus no practical use for such a posit. The pragmatically significant predictions are those that refer to finite sequences, and alternative inductive methods must be judged with respect to these predictions. So the question again is: What reason do we have to believe that the standard inductive method will probably be as successful or more successful over *finite* ranges than an alternative method? Our third criticism of Professor Reichenbach's justification of induction is that it provides us with no such reason.

It may perhaps be objected that we are asking too much of a justification of induction. Our answer is that the requirements are set by the traditional meaning of "justification of induction" and (what sets the same requirements) by any attempt to establish a presuppositionless empiricism. A sketch of Reichenbach's argument will show this to be the case. We began with the question: How are *primary* probability assertions established? The answer was that primary probability sentences are empirical and may be established empirically without the assumption of other probability assertions (e.g., without presupposing that there is a non-zero probability that nature is uniform). The claim that they can be empirically verified then turned out to mean that they can be posited in accordance with the rule of induction and that the use of this

rule can be pragmatically justified without making prior empirical assumptions. But to justify the use of a method is to show that it is more useful than alternative methods at our disposal. Clearly it is not enough to show that the standard inductive method has been more useful than the alternatives would have been: as far as the past is concerned, its utility might have been accidental; we must use the standard inductive method to establish our knowledge of the past; and we are interested in future utility. On the other hand it would be asking too much to demand certain success of the method. Thus we are led to the requirement: To justify induction one must give reasons to believe that the expectation value over *finite* ranges of the standard inductive method is as great as or greater than that of other methods, without an appeal to empirical assumptions.

Since Professor Reichenbach has not provided such a justification, we must conclude that his empiricism is without a foundation; whether "probable" is interpreted in the finite frequency or the limit frequency way, his theory does not explain how primary probability propositions can be verified empirically. This statement is not intended as a reflection on the ingenuity of his argument or the solidity of his contribution to the theory of probability, philosophical as well as mathematical. Rather, it is the outcome of a conviction that Hume showed the impossibility of establishing a presuppositionless empiricism or, what comes to the same thing, the impossibility of *justifying* induction. Hume's result follows quite directly from his dichotomy of propositions into the empirical and the rational: to justify induction one would need to show something about the actual or probable character of the world; this information would be expressible in a proposition, either rational or empirical; but a rational proposition would say nothing about the actual world *as distinguished from* other possible worlds, and an empirical proposition would give rise to the same question that we started with. This conclusion concerning the question *How does one justify induction?* is analogous to the modern mathematician's answer to the ancient question *How does one square the circle with ruler and compass?* In both cases the problem has no solution, though of course in the

mathematical case the result is established with a rigor that is impossible in philosophy.

There is no reason to be pessimistic over this conclusion, however, for it does not entail that we should be distrustful in practice of the standard inductive method. The statement "The use of the standard inductive method cannot be justified" does seem to imply this, but only because it is a misleading way of formulating the conclusion. The same difficulty obtains with regard to the following dramatic expression of Hume's result: "Hume showed that there is no evidence for the assertion that the sun will rise tomorrow or that nature is uniform." The implication here is that astrology is as reliable as astronomy and that the practice of witchcraft is as justifiable as the use of the results of science. These are all misleading ways of expressing the essential point because the criterion of what is *justifiable, evidential, reliable,* etc., as these terms are ordinarily used, is the standard inductive method. As "evidence" is normally used it is perfectly true to say that there is good evidence that the sun will rise tomorrow and that nature is in some sense uniform. It would be better to express Hume's result by "It is impossible to give reasons to believe that the expectation value over finite ranges of the standard inductive method is as great as or greater than that of other methods *without* an implicit or explicit appeal to empirical assumptions." This sentence gives no cause for a sceptical attitude towards the future except to one who has already committed himself to the solipsistic position that he should believe no empirical propositions other than those about his immediate, personal experience and any other empirical propositions deducible from these without the use of empirical assumptions. A philosopher quite properly worries more about the correctness of any given theory of induction than about the probable success of the standard inductive method.

When a problem is shown to be unsolvable the proper procedure is to turn to another, related problem. As we noted before, scientists and the common man do employ inductive arguments which conclude with a declarative use of "It is probable that..." Since it is futile to attempt to "justify" this practice, the remaining task is to give an account and expla-

nation of these arguments. This we can do by explicitly formulating some general propositions (e.g., finitude of qualities, the existence of laws, the uniformity of nature) which could reasonably be accepted by users of inductive arguments and which, when added to the premises of inductive arguments, make them explicitly deductive. Hume's result shows that all verification of empirical propositions must presuppose other, more general empirical propositions (including primary probability assertions), and it is philosophically important to become clear as to what these assumptions are and how they function in inductive arguments. In other words, since it is impossible to establish a presuppositionless empiricism, it is important to formulate clearly the presuppositions of empirical verification.

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***Critical Studies***

# PLATO AS MATHEMATICIAN

Proclus in his summary of the history of mathematics says that Plato's concern for these studies caused them and particularly geometry to make very great progress, and in support of this judgment he cites "the obvious fact that Plato packed his writings with mathematical discussions and everywhere awakens admiration for mathematics in those who take up philosophy." [1] The *Herculanean Index* more specifically asserts that mathematics made great progress under the direction of Plato, who formulated problems which the mathematicians zealously investigated; [2] but even this does not necessarily mean that Plato contributed to the solution of any of the problems that he propounded, and that he in fact did not do so could be inferred from the very words here used, ἀρχιτεκτονοῦντος . . . Πλάτωνος, interpreted after Plato's own statement, ἀρχιτέκτων γε πᾶς οὐκ αὐτὸς ἐργατικὸς ἀλλ' ἐργατῶν ἄρχων.[3] Most modern scholars have come to the conclusion that Plato, while he exercised great influence as an enthusiastic advocate of mathematical study and an intelligent critic of mathematical methods and aims, did little or no original work in technical mathematics himself; [4] but extreme positions have been taken up by others. Erich Frank has contended that Plato the creative mathematician is a mere fable, that he was in fact scarcely able to keep abreast of the mathematical developments of his time, and that nothing is more perverse than to suppose that he presents a true picture of contemporary science. Others have insisted, however, upon ascribing to Plato an important part in the mathematical discoveries and developments of the fourth

[1] *In Primum Euclidis Elementorum Librum Commentarii* ed. Friedlein, p. 66, 8-14.

[2] *Academicorum Philosophorum Index Herculanensis* ed. S. Mekler, col. Y, 2-7 (pp. 15-16). The author is apparently quoting a source whose name has been lost from the papyrus (cf. φη<σ>ι: Y, 2).

[3] *Politicus* 259 E.

[4] Cf. Heath, *A History of Greek Mathematics*, I, p. 316 and *A Manual of Greek Mathematics*, p. 171; Heiberg, *Geschichte der Mathematik und Naturwissenschaften im Altertum*, p. 10; A. Rey, *La Science*

century,[5] and to the establishment of this position Dr. Mugler's new and extensive study [6] is devoted.

Mugler maintains (pp. xvii-xix) that interpreters have been mistaken in drawing from the pedagogical plan of *Republic* VII any general conclusion concerning the relative position which Plato assigned to philosophical speculation and mathematics, that in Plato's own intellectual experience the relation of the two was the reverse of that assigned to them there, mathematics being more often the end of metaphysical reflection than its point of departure, and that he recommended mathematical study to his pupils not merely as a propaedeutic for dialectic but primarily because from his own experience he believed that subsequent philosophical meditation upon the fund of knowledge thus acquired would often lead to mathematical discoveries. Mugler does not say how this thesis is to be reconciled with the fact that at the end of the *Laws* (965 B 1 ff.) dialectic is still declared to be the supreme science and that in such a late passage as *Philebus* 57 D ff. as well as in an early one like *Euthydemus* 290 C, neither of which is "pedagogical," the supremacy of dialectic and its priority to mathematics are affirmed as emphatically as in *Republic* VII; [7] he simply says that a close interpretation of the "meta-

*dans l'Antiquité*, IV, pp. 291 and 296. Z. Jordan in the French résumé of his Polish book, *Des Fondements Mathématiques du Système de Platon* (Poznan, 1937), says (p. 289): "... la place occupée par Platon dans l'histoire des mathématiques n'est pas due à ce qu'il les ait enrichies de façon directe. On peut parler de Platon en tant que mathématicien seulement dans ce sens que c'est lui le premier qui s'est adonné à la méthodologie des mathématiques, qui n'a cessé de refléchir sur l'objet de la connaissance mathématique, qui a analysé les méthodes pratiquées et conçu des méthodes nouvelles."

[5] Erich Frank, *Logos, IX* (1920-21), p. 253 and *Plato und die sogenannten Pythagoreer*, p. 65. Seth Demel, *Platons Verhältnis zur Mathematik* (Leipzig, 1929) expressly opposes Frank's thesis and finds the strongest proof of Plato's mathematical creativity in his unique friendship with Theætetus (p. 24)!

[6] *Platon et la Recherche Mathématique de son Époque*, by Charles Mugler (Strasbourg-Zurich, Éditions P. H. Heitz, 1948. Pp. xxviii + 427).

[7] On the *Laws* cf. Shorey, *Unity of Plato's Thought*, p. 87 and A. E. Taylor, *Plato* [6], p. 497; on the *Philebus* cf. Hackforth, *Plato's Examination of Pleasure*, p. 113.

physical" dialogues and the *Timaeus* will substantiate his contention, and it is therefore necessary to examine his interpretation in detail.

This interpretation begins with a chapter, the purpose of which is to demonstrate that Plato "dematerialized" the foundations of geometry by eliminating sensory and empirical implications from its terms and definitions. The method of the demonstration is to compare the terms and definitions which appear in Plato's writings with those used by his predecessors and by the later geometers. No other procedure is possible; but, since of Plato's predecessors and early contemporaries there are extant in the original words only a very few sentences which deal with mathematics and since moreover Plato in his dialogues usually avoids technical terminology and linguistic innovation,[8] it is hazardous to draw any general conclusion from such a comparison, even though it is plausible to assume that Plato would have welcomed a "dematerialization" of geometrical terms since he insisted that the objects of the geometer's investigation are not the material figures that he draws but absolute, immaterial, and atemporal realities.[9] In fact, however, Mugler's detailed study of Plato's terminology for space, place, dimension, line, surface, figure, area, and solid produces little or no support for his conclusion in this chapter. Plato's use of αὔξη for "dimension," for example, scarcely suits the hypothesis of reform; and neither does the definition of "straight" in *Parmenides* 137 E.[10] It may be that Plato's objection to the point as a "geometrical dogma"[11] explains the absence from his writings of a general term for point; but the objection in this case was not to the term used by geometers at the time but to the assumption that

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[8] Cf. *Theaetetus* 184 C, *Politicus* 261 E 5-7; and Plato's apology for introducing a new technical term: *Theaetetus* 182 A 8 ff.

[9] Cf. *Euthydemus* 290 C 1-3, *Republic* 510 D and 527 B 5-8.

[10] Cf. Heath, *Euclid: The Elements, I*, pp. 165-166.

[11] Aristotle, *Metaphysics* 992 A 20-22. Mugler does not consider Ross's punctuation of this sentence; but in any case he is mistaken in interpreting it to mean (p. 19) that Plato sought to define the point as the beginning of a line. The meaning given by Alexander (*Metaph.*, p. 120, 4-6) is right: *τὸ μὲν οὖν σημεῖον οὐκ ἔλεγεν εἶναί τι οὐδὲ ὠνόμαζεν, ἐκάλει δὲ ἀρχὴν τῆς γραμμῆς πολλάκις ἣν ἄτομον γραμμὴν ἔλεγεν.*

there is an entity which this or any alternative term can signify.[12] The word *βάθος* according to Mugler (pp. 10-13) was freed of its concrete significance and introduced to geometrical terminology in the abstract sense of "third dimension" by Plato, who was the first occidental thinker to recognize clearly the three-dimensional character of geometrical space: but Plato's own use of *τὸ βάθους μετέχον* as a term that needs no explanation (*Republic* 528 B) makes this conclusion improbable, and it is impossible if Gorgias really wrote *σῶμα δὲ τυγχάνον τριπλοῦν ἔσται· καὶ γὰρ μῆκος καὶ πλάτος καὶ βάθος ἕξει.*[13] It is indulging in the merest fantasy to argue further, as Mugler does (pp. 13-17), that Plato conceived time to be a fourth dimension and set up a hierarchy of spaces beginning with two-dimensional planar space and rising through stereometrical space to four-dimensional kinematic space. The "spatial terminology" used of the intelligible world (*νοητὸς τόπος, ἀληθείας πεδίον*, etc.), which is somehow supposed to justify this conclusion (pp. 14-15), is later (p. 279) admitted to be only the symbolic language of myth; and *Timaeus* 52 A - C is explicit in divorcing real being from space and position in every sense whatever. Nor does *Republic* 528 D ff., on which Mugler chiefly depends, support the notion that astronomical space is considered to be a kinematic space of four dimensions hierarchically "above" stereometric space; astronomy is there taken as only one example of the study of movement, of which another on the same level as

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[12] Plato's nephew and successor, Speusippus, used the term *στιγμή* for "point" (frag. 4, lines 40, 45, 48, 70 [ Lang ]); for him the point was a real entity (cf. Cherniss, *Aristotle's Criticism of Plato and the Academy* I, n. 322 [ p. 397 ]). On the other hand, one cannot be certain that the "later" term *σημεῖον* was not already used for "point" in Plato's time and earlier (cf. Euripides, frag. 382, 3-4 [ Nauck² ]). Mugler in his treatment of the terms for surface (pp. 32-37) has also overlooked Speusippus' use of *ἐπιφάνεια* (frag. 4, lines 60 and 70 [Lang]).

[13] Fragment B 3, 73 (II, p. 281, 6-7 [Diels-Kranz]). Even if there were any evidence against the authenticity of the words used, there would still be no reason to doubt that the argument with its assumption of the three-dimensionality of geometrical space occurred in Gorgias' treatise. Aristotle assumes that the definition of *σῶμα* as *τὸ ἔχον τρεῖς διαστάσεις* is generally accepted (*Topics* 142 B 24-25, *Physics* 204 B 20, *Metaphysics* 1016 B 27-28, etc.).

astronomy both as rightly and wrongly pursued is the science of harmony.[14]

It is the thesis of the second chapter that Plato made decisive and fertile innovations in the theory of geometrical similarity. This thesis is made to depend largely upon the argument that Plato invented the technical term ἴσος καὶ ὅμοιος to designate the congruity of figures. Mugler contends that this terminological innovation was inspired by the desire to make the notion of equality by superposition derivative by representing it as a special case at once of equivalence (ἰσότης) and of similarity (ὁμοιότης) so as to avoid the empirical factor of motion in a question concerning the fundamentals of geometry and that this is another manifestation of the "Parmenidean tendency" which characterizes Plato's geometrical reflections.[15] The significance of this innovation is appealed to again and again to support the most various hypotheses in the subsequent chapters of the book. Yet Mugler cites (pp. 54-55) from Plato's writings only one occurrence of the term, *Timaeus* 55 A (. . . ὅλον περιφεροῦς διανεμητικὸν εἰς ἴσα μέρη καὶ ὅμοια . . .), which even if ἴσα καὶ ὅμοια here was meant to carry the technical sense indicated, is scarcely sufficient to prove that Plato was the inventor of the term; and the one passage that he adduces (p. 62) to testify to Aristotle's acquaintance with the technical expression does not contain it at all. In this passage, *Metaphysics* 1054 A 29-32 (ἔστι δὲ τοῦ μὲν ἑνός . . . τὸ ταὐτὸ καὶ ὅμοιον καὶ ἴσον τοῦ δὲ πλήθους τὸ ἕτερον καὶ ἀνόμοιον καὶ ἄνισον), Mugler takes ὅμοιον καὶ ἴσον together to mean "equality" and ἀνόμοιον καὶ ἄνισον together to mean "inequality"; but in that case Aristotle should have written τὸ ταὐτὸν καὶ τὸ ὅμοιον καὶ ἴσον . . . τὸ ἕτερον καὶ τὸ ἀνόμοιον καὶ ἄνισον, and moreover the parallel passage at

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[14] *Republic* 530 C — 531 D, cf. *Laws* 747 A; observe also that in *Laws* 747 A and 817 E plane and solid geometry are considered to be a single study, so that there is clearly no "hierarchical" difference between the "spaces" which they study. Mugler does not mention Aristotle's argument to prove that there can be no more than three dimensions (*De Caelo* 268 A 9 - B 5), though he refers to Ptolemy's lost treatise on the subject.

[15] Mugler (pp. 58-59) suggests that the geometers from Euclid to Archimedes sought for the same reason to avoid the method of superposition; but cf. *contra* Heath, *Euclid: The Elements*, I, pp. 225-6.

1003 B 33-36 (. . . λέγω δ' οἷον περὶ ταὐτοῦ καὶ ὁμοίου καὶ τῶν ἄλλων τῶν τοιούτων) shows that ταὐτό, ὅμοιον, and ἴσον in 1054 A 29-32 are three separate and parallel terms.[16] Much stranger than this interpretation, however, is Mugler's contention (p. 103) that Plato's invention of the technical term ἴσος καὶ ὅμοιος is proved by *Parmenides* 131 A and 132 E because he "there opposes to each other the two determinations of magnitude and form which are united in this term to designate geometrical congruity." In the former of these passages, οἷον ὁμοιότητος μὲν μεταλαβόντα ὅμοια, μεγέθους δὲ μεγάλα (131 A 1), Mugler says that ὁμοιότης and μέγεθος are nothing but the εἶδος and μέγεθος of Euclid's *Data* and in the latter, οὗ δ' ἂν τὰ ὅμοια μετέχοντα ὅμοια ᾖ, οὐκ ἐκεῖνο ἔσται αὐτὸ τὸ εἶδος; (132 E 3-4), that "Plato uses in connection with similarity the term εἶδος by which Euclid designates the characteristic element of similar figures." A glance at the whole sentence of 130 E - 131 A shows that ὁμοιότης and μέγεθος are not, however, set off against each other or treated as a special pair, that ὁμοιότης is a reference to the ideas of ὁμοιότης and ἀνομοιότης mentioned by Socrates in 129 A ff., and that here along with it are listed not only μέγεθος but also κάλλος and δικαιοσύνη as examples of ideas. In 132 E the term εἶδος is used in connection with similarity (ὅμοια) in no special sense but exactly as it is in connection with μέγεθος, κάλλος, and δικαιοσύνη in 130 E - 131 A. In short, Plato says that μέγεθος is an εἶδος too[17] for εἶδος here means "idea," which, of course, it does not in Euclid's *Data*.[18]

[16] A few lines later, 1054 B 2, Aristotle uses the term ἴσα καὶ ἰσογώνια where, as Mugler seems to recognize (p. 62), he might have been expected to say ἴσα καὶ ὅμοια if he had just previously used this phrase as the technical term sought by Mugler.

[17] Cf. also 131 C - D, *Phædo* 65 D - E and 100 E - 101 A.

[18] It is true, as Mugler says (p. 105), that Plato often uses εἶδος with the implication of shape or geometrical figure; but he uses it still more often in contexts which preclude any such significance whatever, for example in *Laches* 191 D (ἐν σύμπαντι τῷ πολεμικῷ εἴδει), *Gorgias* 454 E (δύο εἴδη πειθοῦς) and 473 E (εἶδος ἐλέγχου), *Republic* 363 E (εἴδος λόγων), *Timaeus* 51 A (ἀνόρατον εἶδός τι καὶ ἄμορφον to signify χώρα, the formless receptacle, cf. 49 A 3-4), *Philebus* 32 C 12 (εἶδος used of ἄπειρον, cf. 16 D 7: τὴν τοῦ ἀπείρου ἰδέαν). The evidence therefore does *not* "seem to indicate that Plato in imagining the metaphysical εἶδος took his start from the theory of the geometrical εἶδος."

All that remains then of Mugler's evidence for Plato's use, not to mention his invention, of ἴσος καὶ ὅμοιος as a technical geometrical term is *Timaeus* 55 A; and that even ἴσα μέρη καὶ ὅμοια in this passage is evidence of such a *terminus technicus* becomes questionable when one considers that the other collocations of ἴσος and ὅμοιος in Plato's writings occur in non-geometrical passages [19] and that Aristotle, who could still use ὅμοιος to mean "equal" in a geometrical sense, also used the combination ἴσος καὶ ὅμοιος only in non-geometrical contexts.[20] Mugler does not explain or even mention these occurrences of the phrase.

The earliest extant enunciation of the conditions of geometrical similarity seems to be Aristotle's reference in *Anal. Post.* 99 A 13-14; but Mugler believes (p. 106) that an allusion to these conditions is contained in the expression τὸ ταὐτὸν πεπονθὸς ὅμοιον which occurs in *Parmenides* 139 E and 148 A and that this is a technical term of the older geometers, a survival of which is to be seen in ἀντιπεπονθέναι as used by Euclid in *Elements* VI, Prop. 14 etc. Mugler might have cited *Metaphysics* 1018 A 15-17 where Aristotle gives τὰ πάντῃ ταὐτὸ πεπονθότα and τὰ πλείω ταὐτὸ πεπονθότα along with ὧν ἡ ποιότης μία as meanings of ὅμοια; but, though this combined with the passages of the *Parmenides* makes it seem probable that τὰ

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[19] *Laws* 741 A: τὴν ὁμοιότητα καὶ ἰσότητα καὶ τὸ ταὐτὸν καὶ ὁμολογούμενον τιμῶντες κτλ. *Laws* 837 A: φίλον μέν που καλοῦμεν ὅμοιον ὁμοίῳ κατ' ἀρετὴν καὶ ἴσον ἴσῳ. *Parmenides* 140 E: ἰσότητος χρόνου καὶ ὁμοιότητος μεθέξει (though it is not certain that χρόνου here depends upon the compound ἰσότητος καὶ ὁμοιότητος, cf. Cornford, *Plato and Parmenides*, p. 127, n. 1). As for *Parmenides* 161 C (εἰ γὰρ εἴη ἴσον, εἴη τε ἂν ἤδη καὶ ὅμοιον ἂν εἴη αὐτοῖς κατὰ τὴν ἰσότητα), this no more proves that Plato considered "equality in the strict sense," i.e. "equality by superposition" to be "a particular case of similarity," as Mugler thinks it does (pp. 57, 103-4), than does *Parmenides* 148 A (ἦ δὴ τὸ ἓν ἕτερον τῶν ἄλλων πέπονθεν εἶναι, κατ' αὐτὸ τοῦτο ἅπαν ἅπασιν ὅμοιον ἂν εἴη) show that he thought difference in the strict sense to be a particular case of similarity (cf. *Philebus* 13 D).

[20] *Politics* 1287 B 33: ὅ γε φίλος ἴσος καὶ ὅμοιος. *Politics* 1295 B 25-26; βούλεται δέ γε ἡ πόλις ἐξ ἴσων εἶναι καὶ ὁμοίων ὅτι μάλιστα. Cf. *Politics* 1279 A 9-10, 1288 A 1, 1299 B 23-24. For ὅμοιος meaning "equal" cf. *De Cælo* 296 B 20, 297 B 19, 311 B 33-34. In [Aristotle], *Problems* 914 A 22-23 ἴση καὶ ὅμοια is applied to the comparison of *lines*.

ταὐτὸ πεπονθότα was an accepted definition of ὅμοια, there is nothing to indicate that it was ever meant as a definition of geometrical similarity. The passages of the *Parmenides* have nothing to do with this concept,[21] and the examples of ὅμοια given by Aristotle in the parallel passage (*Metaphysics* 1054 B 9-13) show that for him the definition in question had no specific mathematical implications at all.

Unambiguous examples even of ὅμοιος as a technical term for geometrical similarity are difficult to find in Plato's writings.[22] One would expect to find it so used where Plato says instead τοιούτῳ χωρίῳ οἷον in *Meno* 87 A 5, if the interpretation of this passage given by E. F. August and S. H. Butcher and adopted by Heath and Mugler is correct as I believe it is. Benecke had argued that τοιούτῳ οἷον cannot mean "similar" and that, had Plato here used it in that sense, he should have added the condition "not similarly situated." Heath rejected this argument " in view of the want of fixity in mathematical terminology in Plato's time and of his own habit of varying his phrases for literary effect";[23] but Mugler contends (pp. 76-77) that Plato purposely refrained from using ὅμοιον here because in his technical terminology this term was ambiguous, meaning both "similar" and "similarly situated." The evidence for Plato's use of ὅμοιος with the technical meaning later expressed by ὁμοίως κείμενον Mugler finds in *Timaeus* 33 B where the spherical cosmos is called πάντων τελεώτατον ὁμοιότατόν τε αὐτὸ ἑαυτῷ σχημάτων. By this, he contends (pp. 72-74), Plato meant ὁμοιότατον κείμενον αὐτὸ ἑαυτῷ in the sense that the sphere alone of solids admits of an infinite number of displacements in any direction while still in any position remaining similarly situated to itself in any other. The passage so interpreted would testify not only to Plato's use of

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[21] See note 19 *supra* and cf. Cornford, *Plato and Parmenides*, p. 125.

[22] Mugler holds (p. 81) that ἐκ πολλῶν ὁμοίων (*Timaeus* 81 C 6) and εἰς ὁμοιότητα ἑαυτοῖς (81 D 2) are such examples, although the term does not occur in the earlier parts of the *Timaeus* where there is reference to triangles of the same kind but of different sizes (e.g. 57 C - D).

[23] *A History of Greek Mathematics*, I, p. 302, n. 1. Everyone admits that in *Meno* 83 D 6 "similar" is rendered by τοιοῦτον but the nature of Socrates' interlocutor there would explain the purposeful avoidance of a technical mathematical term. Mugler (pp. 75-76) agrees with Benecke in denying that τοιούτῳ οἷον in 87 A 5 can be explained in the same way.

ὅμοιον in the technical sense of "homothetic" (ὁμοίως κείμενον) but also to the extension of the theory of similarity from plane geometry to stereometry. Mugler appears to think that his interpretation is proved because the superlative ὁμοιότατος has no sense here if one translates ὅμοιος by "like," since all figures are equally like themselves. This objection is valid against the translation of Martin, Rivaud, and Robin ("la plus complètement semblable à elle-même"), but the alternative is not Mugler's interpretation. In *Timaeus* 34 B, where the epithets applied to the spherical cosmos in 33 B are repeated, ὁμοιότατον αὐτὸ ἑαυτῷ is replaced by ὁμαλόν;[24] and Cornford, in rendering both, rightly uses the same word, "uniform," which is adequate to the meaning, for, as A. E. Taylor explains, the point of ὁμοιότατον αὐτὸ ἑαυτῷ is that "the sphere is a surface, as the circle is a plane curve, of *constant* curvature, and the only such surface known to Plato and the ancients generally."[25] Whatever mathematical implications are logically involved in this notion of uniformity, there is no reason to interpret the phrase in *Timaeus* 33 B as Mugler does or to see in it any

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[24] Proclus explains the former phrase in 33 B by αὐτὸ ἑαυτῷ συνεχὲς καὶ ὁμαλὲς καὶ τεταγμένον (*In Timaeum*, II, p. 72, 4-5 [Diehl]). According to him (*ibid.*, p. 75, 5-15) all polygons, angular figures, and figures of several surfaces are ἀνόμοια and ἔστι ὅμοιον ἐν στερεοῖς ἡ σφαῖρα μόνον σχημάτων. For the sphere as alone having a single surface cf. Aristotle, *De Cælo* 286 B 23-32 where there is a reference to the *Timaeus* for this notion.

[25] Cornford, *Plato's Cosmology* (1937), pp. 54 and 58; A. E. Taylor, *A Commentary on Plato's Timaeus*, p. 102. In *De Cælo* 285 B 4-5 Aristotle's τὴν ὁμοιότητα τοῦ σχήματος can mean only the uniformity of the sphere in this sense; cf. [Aristotle], *De Xenophane* 977 B 1 (πάντῃ δ' ὅμοιον ὄντα σφαιροειδῆ εἶναι) and Alexander *apud* Simplicius, *Phys.*, p. 895, 16-17 (ὁμαλὴς γὰρ καὶ αὕτη [*scil.* ἡ ἐπὶ τοῦ κύκλου κίνησις] διὰ τὸ πανταχόθεν ὁμοίως περιαγὲς τῆς κυκλικῆς γραμμῆς). It is in the same sense that Plutarch, to explain why the lines of intersection of two round bodies are always circular, says (*De Facie* 932 F): πανταχόσε χωροῦσαι δι' ὁμοιότητα, "since they have everywhere a uniform tendency" (i.e. a constant curvature). In [Aristotle], *Problems* 915 A 35-36 the "round" (τὸ περιφερές), which is called σχῆμα κάλλιστον is defined by the epithet of *Timaeus* 33 B, τὸ αὐτὸ αὑτῷ ὁμοιότατον; and Simplicius (*De Cælo*, p. 411, 4-9) takes as a reminiscence of *Timaeus* 33 B the statement of Ptolemy (*Syntaxis* I, 2 [p. 10, Halma]): ὁμοιομερεῖς δὲ ἐπιφάνειαι μόναι ἥ τε κυκλοτερὴς ἐν τοῖς ἐπιπέδοις καὶ ἐν τοῖς στερεοῖς ἡ σφαιρική.

evidence for the inferences which he draws from that interpretation.

It is naturally in Plato's construction of the regular polyhedra, which are the corpuscles of the material world, that Mugler looks for the application of the theory of geometrical similarity as an "organizing principle of cosmic importance." Part of Chapter II and all of Chapter III are devoted to showing how by employing the recent theorem that limited the number of the regular polyhedra to five, by taking as determinative of the polyhedra their faces alone, the surface-area of which is the invariant in all rearrangement, and by reducing the faces of these regular solids to a limited number of triangles, which are then regarded as the ultimate elements of the physical world, Plato imposed geometrical discipline upon the unlimited polymorphism of the Atomists and introduced into the physical sciences the principle of economy.[26] Unfortunately Mugler interprets *Timaeus* 57 C - D to mean that the elementary triangles, the half-square and the right-angled scalene,[27] exist in different sizes; and from this he infers that, although the supposed technical term ὅμοιος does not occur in this passage, the elements of the physical world are two series of figures, the members of either series being an infinite number of similar triangles infinitely various in magnitude (pp. 79-81, p. 119). He is apparently unaware of Cornford's demonstration that this interpretation is incorrect, that the variation in size of the molecules of any one kind is the result of the different *number* of elementary triangles used in the composition of the squares and equilateral triangles

[26] For this interpretation of Plato's purpose cf. e.g. Shorey, *A.J.P.*, IX (1888), p. 416; P. Friedländer, *Platon*, II, p. 610 and more recently *Univ. of California Publications in Philosophy*, XVI (1949), pp. 232-3.

[27] From neither of these triangles can the faces of the dodecahedron be constructed; and Mugler holds (pp. 127-129) that this was the reason why Plato, inspired by the principle of economy, discarded the dodecahedron in favor of the simpler cube, since he had only four general kinds of matter with which to equate corpuscular patterns. Plato may well have reasoned so; but one should not overlook the fact that he also had reasons of tradition for assigning the dodecahedron to the universe as a whole (cf. *Phædo* 110 B with Wyttenbach's note *ad loc.* and Heath, *A History of Greek Mathematics*, I, pp. 159-162).

which are the faces of the four regular solids, that the magnitudes of the squares and equilateral triangles and of the solids constructed of them are not infinitely various but definitely limited and have a definite mathematical ratio to one another, and that the elementary half-squares and right-angled scalene triangles exist not only each in a single form but each in a single atomic magnitude.[28] Knowledge of Cornford's interpretation would have enabled Mugler to make even more than he does of the "economy" of Plato's mathematical physics, although, as will subsequently appear, it would also have removed the support upon which he rests several important arguments.[29]

At the end of Chapter I Mugler had said that Plato "well before Euclid had contributed to the establishment of the Euclidean character of Greek space." Now at the beginning of Chapter IV he says that "Plato is Euclidean without knowing it," that he was aware of the contradiction between his finite universe and the implications of a geometry of parallel lines, and that he was expecting the resolution of the contradiction in the direction of a non-Euclidean geometry analogous to that of Riemann (pp. 141-149). The evidence for this is chiefly silence: in Plato's works there is no coherent theory of the infinite either mathematical or physical,[30] straight lines when mentioned are always treated as merely segments, and there is no mention of parallels although Aristotle's references

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[28] Cornford, *Plato's Cosmology*, pp. 230-239; cf. Friedländer, *Univ. of California Publications in Philosophy*, XVI (1949), p. 234 and Figures 1-4.

[29] A slight example is his interpretation of ῥίζα in *Timaeus* 81 C 6, which he takes to be equivalent to κέντρον in 54 E 2, the point at which four elementary half-squares meet in the construction of the square and six elementary right-angled scalene triangles meet in the construction of an equilateral triangle (pp. 18, 121-122). He could not have adopted this interpretation had he seen that there are square and equilateral faces which have more or fewer elements than these and in many of which there is no such single "centre."

[30] Mugler does not express himself with respect to such statements of Aristotle as that in *Physics* 206 B 27-33: Πλάτων διὰ τοῦτο δύο τὰ ἄπειρα ἐποιήσεν, ὅτι καὶ ἐπὶ τὴν αὔξην δοκεῖ ὑπερβάλλειν καὶ εἰς ἄπειρον ἰέναι καὶ ἐπὶ τὴν καθαίρεσιν.

to them show that geometers of the Academy were occupying themselves with the problem of parallelism. There are indications in Aristotle (e.g. *Anal. Prior.* 65 A 4-9) that attempts to demonstrate the existence of parallels had already been made, but there is nothing to show that the failure of these attempts had suggested to anyone the possibility of a non-Euclidean geometry.[31] If, as Mugler maintains (pp. 141-2), Plato did not suspect that his acceptance of geometrical similarity committed him to the geometrical infinity implied by parallel lines,[32] it is difficult to see why we must assume that

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[31] It might be thought that Aristotle envisaged such a possibility when he wrote (*Physics* 200 A 18-19): ἀλλ' εἴγε τοῦτο (i.e. that the sum of the angles of a triangle equals two right angles) μὴ ἔστιν, οὐδὲ τὸ εὐθὺ ἔστιν (cf. Heath, *Mathematics in Aristotle*, p. 101); but in reality this is no more evidence that he conceived of such a possibility (cf. *Anal. Prior.* 66 A 11-15) than *De Anima* 406 B 4-6 is evidence that he conceived as possible the doctrine of bodily resurrection.

[32] Mugler elsewhere insists (pp. 241-2, 257-8, and especially 388) that οὐκοῦν εἴη ἂν τοιοῦτον χωρίον καὶ μεῖζον καὶ ἔλαττον (*Meno* 82 C 3-4) was consciously intended as a postulate of the Euclidean structure of space. I think that it is on the contrary merely a precaution against the slave's denying after his first set-back that a square twice the size of the first can be constructed at all; it could scarcely have been meant to carry the technical geometrical import that Mugler reads into it especially in a passage where the immediately preceding definition is not even a sufficient definition of a square (82 B 10 - C 2; Mugler [p. 388] erroneously takes ταυτασὶ τὰς διὰ μέσου in 82 C 2-3 to mean "diagonals," in which case the conditions stated would be sufficient, but in fact this means the lines midway between the sides of the square and parallel to them [cf. Thompson, *The Meno of Plato*, p. 130]). Since Mugler does, however, take *Meno* 82 C 3-4 to be a conscious enunciation of the homogeneity of space, he is all the less justified in supposing (pp. 258-65) that the wording of *Timæus* 55 A (μίαν στερεὰν γωνίαν ποιεῖ, τῆς ἀμβλυτάτης τῶν ἐπιπέδων γωνιῶν ἐφεξῆς γεγονυίαν) was chosen in order to avoid the equation with two right angles because Plato shrank from the difficulties involved either in postulating the equality of all right angles (Euclid, *Postulate* 4) or in demonstrating this equality by application which would in turn involve the assumption of the invariability of figures. If he had consciously postulated the homogeneity of space, there was no reason for him not to recognize that he had in fact postulated the equality of all right angles; and, if he merely assumed the former without an explicit postulate, as he does throughout the *Timaeus* (so Mugler, p. 258), it is most probable that he assumed the latter too. The seemingly strange wording of *Timæus* 55 A, which Mugler like Taylor correctly interprets as not involving any discontinuity of

he was aware of the incompatibility between his doctrine of a finite universe and the geometry of parallel lines.

The problem of infinity has a temporal as well as a spatial aspect. Mugler contends that Plato rejected the conception of cyclical time in the sense of an endless succession of exactly identical cosmic periods, though this and the conception of a finite universe had always gone together,[33] and had substituted for it the theory that time is a monodromic and irreversible flux comparable to the endless progression of the series of whole numbers (pp. 149-174). The phrase *κατ' ἀριθμὸν ἰοῦσαν* in *Timaeus* 37 D 6-7, which he calls (p. 174) "the most rigorous expression of Plato's ideas concerning the temporally infinite," is his evidence for this comparison, though under the influence of *χρόνον . . . κατ' ἀριθμὸν κυκλουμένου* (*Timaeus* 38 A 7-8) he specifies this progression both for time and for number as one of an evolution by means of cycles (pp. 155, 236, 238). It is more than doubtful that by *κατ' ἀριθμόν* in these passages Plato intended any comparison with the series of integers as infinite in any sense;[34] and, if he did not, Mugler's later connection of the passage with Theodorus' supposed method of demonstrating irrationality (p. 238), a far-

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angular magnitude, was probably determined not by any question of the right angle as a determinate unit of angular measurement but by Plato's desire to define the "straight angle" which is revealed if the three equilateral triangles about any apex of the tetrahedron be "flattened out" into a plane. Since the Greeks did not consider the "straight angle" to be an angle at all (cf. Proclus, *In Euclidem*, p. 292, 18-22 [Friedlein] and Heath, *Euclid: The Elements*, III, pp. 48-49), it was not unnatural for Plato, if he wished to define it in terms of angularity, to call it what comes after the greatest obtuseness of plane angles.

[33] Contrary to what Mugler asserts, there is no evidence to prove that Anaximander held the doctrine of exact cyclical return and it is certain that Heraclitus neither held it nor was thought by Plato to have held it: cf. Heraclitus, frag. B 30 (I, pp. 157-8 [Diels-Kranz]); Vlastos, *Class. Phil.*, XLII (1947), p. 165; Plato, *Sophist* 242 E.

[34] The phrase probably means only "numerably" and is the correlate of *ἀριθμοῖς* in 39 C: *οὔτε πρὸς ἄλληλα συμμετροῦνται σκοποῦντες ἀριθμοῖς*. Plato did elsewhere state that the series of integers is infinite (*Parmenides* 144 A); but his reference to "the perfect number of time" in *Timæus* 39 D is enough to show that in speaking of time as a likeness of eternity *κατ' ἀριθμὸν ἰοῦσαν* or as *κατ' ἀριθμὸν κυκλούμενος* he had no intention of referring to the infinity of this series.

fetched connection in any case, is quite without foundation. Still more important for Mugler's reconstruction of Plato's mathematical philosophy, however, is his notion that in this passage Plato represents time as being derived from eternity by a kind of projection or emanation, a derivation which is equivalent to the evolution in discursive reason of the instantaneous intuition (pp. 164, 169-70). In the doctrine of time so interpreted he sees both the reconciliation of the Pythagorean apagogic demonstration of the irrational with the geometrical demonstration which he ascribes to Theodorus (pp. 224-38, 276-7) and at the same time the philosophical conception that made the formulation of the geometrical method of analysis possible and of which that method is a precise methodological adaptation (pp. 283, 307-10, 322). He even goes so far as to assert (pp. 281-2) that the theory of space in the *Timaeus* is a corollary of the theory of time there and that Plato, though he hesitated to take the final step in making space the extension of an unextended ὁμοῦ πᾶν as he had made time the development of an atemporal ὁμοῦ πᾶν, was aware that his theory of space was incomplete and was prevented only by death from completing it in this sense.[35] In support of this notion Mugler finds in an opinion of Speusippus and his circle which is cited by Proclus the application of the theory of time in the *Timaeus* to the suppression of the distinction between problems and theorems (pp. 277-8). His use of this passage is typical of much of his interpretation. He says that the expression πάντα ταὐτά which Speusippus used corresponds to the μένοντος αἰῶνος ἐν ἑνί of *Timaeus* 37 D 6 and recalls the Parmenidean ὁμοῦ πᾶν, and he suggests that this term, πάντα ταὐτά, may signify besides its denial of temporal succession to the ideal world the assertion of the unextended coexistence of that real world in a single point. The words in question, ἄμεινον οὖν φασὶ λέγειν ὅτι

[35] According to Mugler (p. 282) *Timæus* 50 C 6 is Plato's promise to complete this theory; but the τρόπον τινὰ δύσφραστον καὶ θαυμαστόν, ὃν εἰς αὖθις μέτιμεν there refers to μέθεξις, the ultimate explanation of which could never be given at all, as Plato had himself indicated in *Phædo* 100 D. Certainly the derivation of space from ideal reality would not have provided that explanation; it would only have rephrased the problem. The remark, εἰς αὖθις, then, is not a promise of later treatment but the regular Platonic formula for dismissing the matter.

πάντα ταὐτά ἐστι (Proclus, *In Euclidem*, p. 78, 4 [Friedlein]) mean simply "they say that it is better to assert that all propositions (πάντα) are of the same kind (ταὐτά)," by which is meant that all so-called problems are the same as theorems.[36] There is no such term here as πάντα ταὐτό and not the remotest connection with the αἰών or the theory of time in the *Timaeus*, whatever that may be.

Nothing in Plato's writings suggests that he ever contemplated deriving space from ideal reality. To the contrary, the *Timaeus* asserts most emphatically that the χωρισμός is an ultimate fact not to be explained away; and Mugler's assumption that Plato tried or intended to try to "overcome" it not only goes counter to the evidence of the dialogues but, like all such interpretations, is a subversion of the very motivation of Plato's philosophy.[37] Nor was Plato's doctrine of space consciously or unconsciously a corollary of his doctrine of time. Space, as Cornford has rightly emphasized (*Plato's Cosmology*, pp. 102-3), is treated under the heading of "Necessity" as being both a condition of phenomenal existence and a factor which limits the effect of Reason (*Timaeus* 47 E ff.), whereas time is a product of the rational ordering of the phenomenal world. Yet neither is time an emanation of eternity or in any sense derived from it. Time is produced by the motions of the heavenly bodies (*Timaeus* 38 E 4-5), the purpose of whose existence is to define and preserve the numbers of time (38 C 3-6) and the measurement of whose motions against one another *is* time (39 C - D). In short, time is the rational aspect of orderliness in the phenomenal world

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[36] Cf. Heath, *Euclid: The Elements*, I, p. 25. Mugler reads Friedlein's text without indicating any knowledge of Tannery's suggestion (*Mém. Scient.*, IX, p. 126) that the true reading is πάντα ταῦτα ἐστι. If Tannery is right, as he probably is, there is not even the semblance of an excuse for Mugler's fantasy.

[37] Cf. *Timæus* 52 A - D, which, be it noted, comes after what Mugler thinks is Plato's promise in 50 C to "complete" the theory of space in the direction of derivation (see note 35 *supra*). On the mistaken supposition that Plato must have attempted to overcome the χωρισμός cf. E. Hoffmann in Zeller's *Philosophie der Griechen*, II, 1[5] (1922), pp. 1092-3 and *Platonismus und Mystik*, pp. 12-13, and A. Faust, *Der Möglichkeitsgedanke*, I, p. 72.

by which alone the flux of becoming can *simulate* the eternity of real being (*Timaeus* 39 D 7 - E 2).[38] There is no justification then for Mugler's use of the doctrine of time in the *Timæus* as the key to Plato's rôle in the development of the theory of irrationals and in the formulation of the method of analysis.

By far the greater part of Chapter IV is devoted to Plato's attitude towards the infinitesimal (pp. 174-249). Mugler first (pp. 175-188) explains as the result of confusion Aristotle's ascription to Plato of the doctrine of atomic lines; he is right, I believe, in his conclusion, although many of the arguments by means of which he reaches the conclusion are erroneous.[39] This conclusion, he says, is confirmed by Plato's knowledge of the "new procedure" employed by Theodorus to demonstrate the irrationality of $\sqrt{3}$, $\sqrt{5}$, ... $\sqrt{17}$. The remainder of the chapter is an attempt to establish Plato's part in the development of the theory of irrationality. It is too complicated and often too confused to be resumed in detail here; but it may fairly be said that as a whole this reconstruc-

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[38] Cf. *De Generatione* 336 B 27 - 337 A 7 for the way in which Aristotle adapts to his purpose the passage of the *Timæus* on time as an imitation of eternity (Cherniss, *Aristotle's Criticism of Plato and the Academy* I, pp. 420 and 465-6).

[39] One is the argument from the infinite variety of sizes in which the two elementary triangles are supposed to exist. I have already observed (pp. 404-05 *supra*) that this is an erroneous interpretation of *Timæus* 57 C - D; and I take this opportunity to state that I once mistakenly used this passage of the *Timæus* myself for a similar purpose (Cherniss, *Aristotle's Criticism of Plato and the Academy* I, p. 126). Mugler's analysis of *De Lin. Insec.* 968 A 14 ff. and of *De Generatione* 316 A 11-12 is inexact, although in the latter passage and in the former treatise there is the confusion which he observes of ideal and material indivisibility (cf. Cherniss, *op. cit.*, pp. 124-8). *Physics* 187 A 1 ff., however, has nothing to do with Plato, as he mistakenly supposes it does, misled in this by Ross's note in his *Metaphysics*, I, p. 206 and unaware apparently that in his *Physics*, pp. 480-1 Ross recognized his error and corrected it (cf. Cherniss, *op. cit.*, p. 15). This being so, Mugler's long argument to prove that Plato could not have misunderstood the import of Zeno's paradoxes in the way implied in this passage (pp. 181-188) is entirely irrelevant. He would have done better to cite *Physics* 206 B 27-33 as evidence that Aristotle himself did not believe Plato to have set a limit to the divisibility of a line in space (cf. Cherniss, *op. cit.*, pp. 128-9).

tion can have no plausibility unless Mugler is right in his interpretation of the nature of Theodorus' method and of its historical relation to Plato's thought. Mugler (pp. 191-203) takes as an established certainty Zeuthen's conjecture that the demonstration alluded to in Plato's *Theætetus* 147 D 3-6 was not an extension of the traditional apagogic proof of the irrationality of $\sqrt{2}$ [40] but a new geometrical demonstration discovered by Theodorus himself; it would have depended on the form of the periodic continued fraction, and the construction itself according to Mugler must have corresponded at least in spirit to that suggested by Heath (*A History of Greek Mathematics*, I, pp. 207-8) which turns upon the recurrence of similar figures of infinitely decreasing magnitude.

The sole evidence for Theodorus' demonstration is the passage of the *Theætetus*, and that reveals only that he began with $\sqrt{3}$ and selecting one surd after another up to $\sqrt{17}$ there somehow stopped. This tells nothing of the method that he used; [41] but Mugler adopts Zeuthen's reasons for denying that it could have been an extension of the traditional apagogic proof: 1) this would not have been original enough to warrant Plato's notice of it as a new discovery; and 2) it would not have had to be applied separately to each surd up to $\sqrt{17}$, since its general applicability would become clear before that point is reached, while at the same time it involves no good reason for stopping at $\sqrt{17}$. The second argument was adequately answered by von Fritz in 1934 (*R.E.*, Zweite Reihe V, 2, cols. 1819-1824); and in 1938 quite independently G. H. Hardy and E. M. Wright (*An Introduction to the Theory of Numbers*, pp. 41-3) proved that the application of the

[40] Cf. Aristotle, *Anal. Prior.* 41 A 25-27 and 50 A 35-38 and Heath, *Mathematics in Aristotle*, pp. 22-3; the demonstration itself is preserved in Euclid, *Element.* X, Appendix, no. 27 (III, p. 408 [Heiberg]).

[41] Mugler insists (pp. 196 and 203) that ἔγραφε and μήκει οὐ σύμμετροι in *Theætetus* 147 D show that Theodorus must have used a "geometrical" as distinguished from the apagogic method. That ἔγραφέ τι περί, the phrase here used, has no such implication was proved by Heath (*A History of Greek Mathematics*, I, p. 203, n. 2); and the apagogic proof preserved in Euclid, X, App. 27 (see note 40 *supra*) itself uses the phrase ἀσύμμετρος ... μήκει (cf. von Fritz, *Annals of Mathematics*, XLVI [1945], p. 256).

apagogic method to the surds $\sqrt{3}\ldots\sqrt{17}$ without assumption of a general theorem would in fact satisfy all of Zeuthen's criteria for the nature of Theodorus' procedure. There is then good reason to believe that Theodorus did *not* use the "geometrical method" which Mugler ascribes to him; and, if he did not, there is no basis at all for any of Mugler's hypotheses (pp. 216-239) concerning the attempt of Theætetus, inspired by Plato, to reconcile Theodorus' "Heraclitean" conception of the irrational with the Pythagorean conception which Mugler calls "Parmenidean," Plato's hope to find in such a reconciliation a "mathematical demonstration of the Platonic theory of Becoming as a projection of Being," his disappointment at Theætetus' failure to achieve this result in adequately rigorous fashion, and his own anticipation of the ultimate solution by the mythical representation of the relation between time and eternity in the *Timæus*.

Moreover, whatever demonstration Theodorus used, there is not the slightest evidence to indicate that it was his own invention.[42] Mugler says that Plato refers to the discovery of Theodorus with "profound philosophical astonishment" and that it was a revelation to Plato of a new aspect of the irrational very different from that in which he had hitherto regarded it (pp. xx-xxv, 195, 203, 239). Yet far from any expression of astonishment Plato does not put into the mouth of Socrates a single word of comment on the demonstration which Theætetus says Theodorus gave, and there is nothing in the passage to suggest that Theodorus had done more than repeat to his pupils what was a standard mathematical demonstration.[43] Even if he did use an original method, however, neither

[42] Zeuthen held that the apagogic method must have been extended to the demonstration of surds other than $\sqrt{2}$ before Theodorus, and this was an additional argument for assuming that he could not have used it. Mugler, on the other hand, asserts (pp. 193-4 and 231) that Theodorus' "great discovery," "the new conception of the irrational," put a check to all interest in the apagogic method, even though Plato's contemporaries "must have dreamed of the possibility of applying the Pythagorean procedure to other rectangular numbers."

[43] This was recognized by Heath, *A History of Greek Mathematics*, I, p. 205; cf. also von Fritz, *Annals of Mathematics*, XLVI (1945), pp. 243-4.

it nor its implications could have been new to Plato when he wrote the *Theætetus*. Theodorus is there represented as an old man in 399 B.C., and this agrees with Eudemus' statement (Proclus, *In Euclidem*, p. 66, 4-9 [Friedlein]) that he was a contemporary of Hippocrates of Chios in the generation before Plato. Even if one chooses to believe that Plato learned of Theodorus' mathematical achievements not in Athens but in Cyrene (cf. Diogenes Laertius, III, 6), he must have done so not later than the middle nineties, more than 25 years before he wrote the *Theætetus* (cf. von Fritz, *R.E.*, V, 2 1811), for he wrote the dialogue after the death of Theætetus in 369 and so at that time knew as well all that Theætetus was to accomplish.[44] It is unreasonable therefore to assume, as Mugler does (pp. 204-10), that doctrines and arguments in later dialogues reflect the influence of a hypothetical discovery of Theodorus that could not have affected Plato before he wrote the *Theætetus;* and the initial improbability of such an assumption is raised to certain impossibility by the evidence of the dialogues themselves. For example, Mugler says (p. 210) that Plato, when in *Republic* 597 C he used the "third man" argument, was either not aware that the reasoning was susceptible of indefinite prolongation or thought such prolongation unnecessary and that only after having seen how Theodorus (in the method which Mugler ascribes to him) employed infinite repetition of similar figures to complete an analogous argument did Plato in the *Parmenides* (i.e. 132

[44] It is not even impossible that at this time he already knew Eudoxus' fundamental contribution to the theory of irrationals as well (von Fritz, *Annals of Mathematics*, XLVI (1945), p. 264). Mugler himself maintains (pp. 242-5) that there is an allusion to Eudoxus' formulation in the *Parmenides*, a dialogue which cannot be much if any later than the *Theætetus*. Unfortunately in the passage of which he makes so much (*Parmenides* 140 C) *οἷς δ' ἂν μὴ σύμμετρον, τῶν μὲν σμικροτέρων, τῶν δὲ μειζόνων μέτρων ἔσται* means only "<If the One is greater or less> than things with which it is not commensurable, it will consist of smaller measures in one case and greater in the other." Here incommensurables are treated as having the same number of different measures (cf. Proclus, *In Parmenidem*, 1206 [Cousin 2]); and it seems that it is only misinterpretation to see in it a hypothesis "de l'inégalité par excès ou par défaut" that is analagous to Eudoxus' formulation as represented by Euclid, V, Def. 5.

A - B) prolong the "third man" argument beyond its finite limits. *Timæus* 31 A, in which the argument is used without express assertion of the infinity of the regress just as it is in the *Republic*, would alone invalidate Mugler's explanation; and he would himself have seen how utterly baseless it is if he had remembered that the argument from the infinity of the regress expressly stated is used in dialogues which are certainly earlier than the *Theætetus*, in the *Cratylus*, for example, (421 D - E) and even and especially in the *Lysis* (219 C).

The geometrical method of analysis, Plato's authorship of which Chapter V is chiefly devoted to establishing, could have been formulated, Mugler contends (pp. xxvii, 283, 292-3, 307-8, 322, 401), only after the relation of time to immobile eternity, which is set forth in the *Timæus*, had suggested the analogous conception of deductive demonstration as the discursive evolvement of intuited mathematical existence. The interpretation upon which this whole thesis rests, namely that in the *Timæus* time is represented as being an emanation or projection of eternity, has already been dealt with (pp. 408-410 *supra*); but, even if that interpretation of Plato's theory of time were correct, it is difficult to see what it could have to do with the method of analysis. This method consists in assuming as true the proposition to be proved or the problem propounded as solved and deducing from this a consequence and from that consequence another until a consequence is reached which is independently known to be true or false. In the latter case the proposition originally assumed is proved to be false or the problem insoluble; in the former, from the consequence known to be true the same sequence of consequences is deduced in reverse order until the original assumption is reached and so proved. Since both the first stage, the analysis proper, and the second, the so-called synthesis, are strictly deductive, each step in the analysis must be unconditionally convertible; and the point of departure is any proposition that one pleases to assume and not "an intuition of geometrical truth." [45]

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[45] Cf. Heath, *A History of Greek Mathematics*, II, pp. 400-401 and *Euclid: The Elements*, I, pp. 137-142; R. Robinson, *Mind*, XLV N.S. (1936), pp. 464-473.

One would suppose that Mugler accepts this orthodox interpretation of geometrical analysis, for he adopts (pp. 293-7) as "the oldest definition of the method" the addition to Euclid, XIII, 1-5 [46] and recognizes "the reversibility of propositions" as an indispensable condition of its application (pp. 321-2).[47] Yet at the same time he insists (pp. 288-93, 310-11) that "the invention of the method is contained in germ" in *Republic* 510-511, that is that the upward movement which in 511 B is said to be peculiar to dialectic was later recognized by Plato as the specifically analytic moment of geometrical method also. So Plato was to invent the analytic method by extending to geometry the reversibility of the movement of dialectic as soon as he should come to see that geometrical truth is "anchored in the unconditioned" by the fact that the results of mathematical investigation exist in the world of ideas prior to the research of them. Now, this last Plato knew when he wrote the *Republic*, for he there says τοῦ ἀεὶ ὄντος ἡ γεωμετρικὴ γνῶσίς ἐστιν (527 B). Mugler repeats an old mistake when he asserts (p. 291) that what distinguishes the methods of the geometer and the dialectician in *Republic* 510-511 is not so much their procedure as their sphere of application. Plato

[46] Euclid, *Opera Omnia*, IV, pp. 364-6 (Heiberg); cf. Heath, *Euclid: The Elements*, III, pp. 442-3.

[47] He even asserts that this "reversibility of propositions" is expressed by the theory of time in the *Timæus* and that in the myth of the *Politicus* the divine pilot "in changing the development of the world into its reciprocal" is conceived as a geometer using the analytic method, descending and reascending in turn the series of propositions and the inverse of them (pp. 322-3). This contradicts his earlier assertion (p. 159) that "time remains in all of Plato's work irremediably monodromic"; it is contradicted as well by Plato's statement in *Laws* 934 A, οὐ γὰρ τὸ γεγονὸς ἀγένητον ἔσται ποτέ, the traditional Greek formula for the irreversibility of time (cf. *Protagoras* 324 B; Aristotle, *Eth. Nic.* 1139 B 8-11; Theognis, 583-4; Pindar, *Olympian* II, 15-17; etc.). Nothing in the *Timæus* suggests the reversibility of time; and in the myth of the *Politicus* the retrograde motion of the cosmos has nothing to do with a theory of time or mathematics. It is conceived as a reaction of the tension created by the motion which God imposes upon the cosmos and to which it bears the same relation as Necessity does to Intelligence in the *Timæus* (cf. *Politicus* 273 B); it is not an aspect of the divine pilot's activity but the result of his complete withdrawal (*Politicus* 270 A, 272 E, 273 C-D) and so could not have been meant to symbolize any intellectual activity.

says exactly the opposite (511 C - D); he insists that it is their methods which distinguish mathematics and dialectic and that the ascending movement of 511 B belongs to dialectic alone (533 B - 534 A).[48] There is no evidence to show that he ever changed his mind in this respect; but, even if he had done so, he could not have invented geometrical analysis by extending to geometry the dialectical ascent of the *Republic*, for that ascent, instead of proceeding by deduction through a series of inferred consequences from something assumed to a consequence already known to be true, moves from a given term or proposition to another which implies it and from this to a third which implies the second and so on until one is reached which implies the whole series and is not itself deducible from anything else.[49] Mugler only confounds confusion further when he likens "the subsumption of the species under the genus to the retrograde path of analysis" and "the passage from genus to species to the deductive process" (pp. 306-7 and 314), for geometrical analysis is a strictly deductive process in both directions but species cannot be inferred from genus, as Plato himself knew (cf. *Politicus* 263 A - B).

For all that, Mugler believes that the reversibility of propositions upon which the method of analysis depends was a discovery that impressed Plato and his school so profoundly that they regarded it as a general law of geometry and were scandalized by what appeared to them to be the one case which withstood all their efforts to make it conform to this law, namely the proposition concerning parallels expressed in Euclid, I, Propositions 27 and 28 (pp. 329-30). It is strange that Mugler, although he argues at length in this connection that the work of Menæchmus implies the recognition of the reversibility of propositions (pp. 324-29), says nothing about Proclus' assertion (*In Euclidem*, pp. 253, 16 - 254, 5) that Menæchmus, Amphinomus, and their associates recognized that not all mathematical propositions are convertible. He also fails to mention

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[48] Cf. Shorey, *Plato's Republic* (L.C.L.), II, p. 206, n. *a* with references; R. Robinson, *Plato's Earlier Dialectic*, pp. 204-209.

[49] Cf. Robinson, *Plato's Earlier Dialectic*, pp. 172-3; Cherniss, *A.J.P.*, LXVIII (1947), pp. 140-5.

Aristotle's remark (*Anal. Post.* 78 A 10-13) that mathematical propositions differ from dialectical propositions in being more commonly convertible (ἀντιστρέφει μᾶλλον), a statement which implies at least that they are not all convertible. These two passages in the absence of evidence to the contrary indicate strongly that Plato and the Academic mathematicians did not assume that convertibility must be a universal law of geometry.[50]

Had Mugler noticed *Anal. Post.* 78 A 5-13, he would not have supposed that in *Physics* 200 A 15-24 Aristotle meant to deny the reversibility of geometrical propositions generally and he could have spared his involved explanation of this presumed denial as a confusion of physical and geometrical relations (pp. 331-356).[51] This passage of the *Analytics* alone, stating as it does that analysis in mathematics is easier than in other subjects because mathematical propositions are more commonly convertible,[52] would also have saved him from the erroneous notion that Plato's disciples are silent about the method and that the first mention of it is made after Euclid's time and from the futile elaboration of dubious psychological theories to explain this supposed silence (pp. 311-320). The fact is that Aristotle refers to geometrical analysis not only once but several times.[53] The tone of these references implies that the method was well known and consciously used by mathematicians generally, and in no case does Aristotle con-

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[50] Aristotle does refer to unnamed persons who maintained the validity of demonstration δι' ἀλλήλων (*Anal. Post.* 72 B 15 ff.); but this was a theory of knowledge in general and not a specifically mathematical doctrine, although it may possibly have been applied by its proponents to a demonstration of parallels also (cf. *Anal. Prior.* 64 B 39 - 65 A 9). I have pointed out elsewhere that this position could not have been taken by Plato, Speusippus, or Xenocrates but was probably that of certain followers of Xenocrates who had abandoned the theory of ideas altogether and therewith any objects for direct knowledge (*Aristotle's Criticism of Plato and the Academy*, I, pp. 66-8).

[51] On *Physics* 200 A 15-24 cf. Ross, *Aristotle's Physics*, pp. 531-3 and Heath, *Mathematics in Aristotle*, p. 101.

[52] Cf. Ross, *Aristotle's Prior and Posterior Analytics*, pp. 549-50.

[53] Besides *Anal. Post.* 78 A 6-13 cf. *Eth. Nic.* 1112 B 11-24 (on which cf. Heath, *Mathematics in Aristotle*, pp. 270-272) and *Soph. Elench.* 175 A 26-28.

nect it with any metaphysical doctrine at all or suggest that its formulation was the work of Plato.

The "tradition" of Plato's authorship of geometrical analysis which Mugler seeks to vindicate (pp. 283-287) consists of two passages: Diogenes Lærtius, III, 24 and Proclus, *In Euclidem*, p. 211, 18-23 (Friedlein). Proclus, however, clearly felt some reserve about saying that Plato transmitted the method to Laodamas, for he protected himself wih the phrase, "as they say." Diogenes indicates that Favorinus was his source for the statement that Plato first explained the method to Laodamas. Neither one says unequivocally that Plato was the first to formulate the method; and the earlier author of the *Index Herculanensis* (Col. Y. 14 ff. [p. 17, Mekler]), whose testimony Mugler does not mention, speaks only of the rise of analysis in Plato's time without ascribing the method to Plato himself. Since Proclus in the passage just mentioned, after reporting the ascription of analysis to Plato, gives as the second method of "discovery" Plato's diæresis,[54] it has been suggested that he or his source confused the complementary procedures of geometrical analysis and synthesis with Plato's συναγωγή and its complementary method, διαίρεσις,[55] a confusion which is seen to have been easy and almost inevitable as soon as one observes that there were many different procedures called by the name "analysis" and that among these was the "upward path" in the *Symposium* (210 A - D, 211 C), which has nothing to do with geometrical analysis but which is a kind of συναγωγή.[56] What makes it highly probable that the "tradi-

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[54] Proclus, *In Euclidem*, pp. 211, 23 - 212, 1. διὰ τῆς τῶν ἄλλων ἀναιρέσεως τῆς τοῦ προκειμένου κατασκευῆς here refers to the separating-off of the privative term in dichotomy and is not a reference to τὰς ὑποθέσεις ἀναιροῦσα in *Republic* 533 C 8; failure to observe this was apparently responsible for Robinson's mistaken notion (*Plato's Earlier Dialectic*, p. 171) that "Proclus seems to have understood division as belonging to the upward path."

[55] Cf. Heath, *Euclid: The Elements*, I, p. 134, notes 1 and 2 and *Mathematics in Aristotle*, p. 272.

[56] Ammonius (*Anal. Prior.*, p. 5, 19-25) calls the upward path of the *Symposium* "analysis" and distinguishes it and the "analysis of philosophers" from geometrical analysis. So Albinus (*Didaskalikos*, V, 4 and 5 [p. 157, 9-37, Hermann]) distinguishes three kinds of analysis, of which

tion," late and uncertain at best, originated in such a confusion is the evidence that geometrical analysis as a recognized method was pre-Platonic. A special form of it, the apagogic method, was consciously employed before Plato began to write [57] and in Plato's early writings is used for non-mathematical demonstrations in a way which assumes general knowledge of its rules; [58] and in *Meno* 86 E Plato himself refers to the formulation of διορισμοί, which implies a conscious use of analysis, and says that it is a common procedure of geometers.[59]

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the first is the upward path in the *Symposium*, the third, called ἡ ἐξ ὑποθέσεως ἀνάλυσις, is a résumé of *Phædo* 101 D - E, and the second is a reduction of *Phædrus* 245 C - E to a scheme which is apparently influenced by geometrical analysis (cf. lines 18-23). Proclus himself sometimes treats analysis as the opposite of diæresis (*In Parmenidem*, 982, 27-28 [Cousin ²]), just as Ammonius does (*Anal. Prior.* p. 7, 35-36) and in this sense identifies it with συναγωγή (cf. also Iamblichus, *Protrepticus*, p. 23, 5-16 [Pistelli]). Aristotle's reference in *Eth. Nic.* 1095 A 32 - B 1 (εὖ γὰρ καὶ Πλάτων ἠπόρει τοῦτο καὶ ἐζήτει πότερον ἀπὸ τῶν ἀρχῶν ἢ ἐπὶ τὰς ἀρχάς ἐστιν ἡ ὁδός) might seem to have had to do with geometrical analysis (cf. Proclus, *In Euclidem*, p. 255, 12 ff. [Friedlein]: . . . πᾶσαι αἱ μαθηματικαὶ πίστεις ἢ ἀπὸ τῶν ἀρχῶν εἰσιν ἢ ἐπὶ τὰς ἀρχάς κτλ.), but this remark too more probably was made in connection with συναγωγή and διαίρεσις (cf. Cherniss, *Aristotle's Criticism of Plato and the Academy*, I, p. 63, n. 51).

[57] Cf. Heath, *A History of Greek Mathematics*, I, pp. 168, 291, 372. Proclus, *In Euclidem*, p. 212, 1-4 (Friedlein), after analysis and diæresis gives reduction to the impossible as a third method but does not mention Plato in connection with it as he did with the preceding two. For the relation of "reduction" to analysis cf. Proclus, *In Euclidem*, pp. 255, 18 - 256, 8 (Friedlein).

[58] E.g. *Phædo* 93 C - 95 A: n.b. τῶν οὖν θεμένων . . . (93 C 3) . . . ἢ καὶ καλῶς δοκεῖ οὕτω λέγεσθαι . . . εἰ ὀρθὴ ἡ ὑπόθεσις . . .; (94 A 12 ff.) . . . οὐκ ἄρα καλῶς ἔχει . . . οὔτε γὰρ ἂν . . . ὁμολογοίμεν . . . αὐτοὶ ἡμῖν αὐτοῖς (94 E 8 ff.). Cf. also *Euthyphro* 9 D 8, 11 B 7, 11 C 4-5 with Burnet's notes.

[59] Cf. Heath, *A History of Greek Mathematics*, I, p. 303 and *Euclid: The Elements*, I, p. 142; and observe that the *Index Herculanensis* (Col. Y, 14 ff. [p. 17, Mekler]) connects the enunciation of διορισμοί with the rise of analysis. Plato does not use the word διορισμός in *Meno* 86 E; and it may be that the term in this sense was introduced by Leon, who according to Proclus (*In Euclidem*, pp. 66, 22 - 67, 1 [Friedlein]) διορισμοὺς εὑρεῖν, a statement usually taken to mean that Leon invented or discovered the method (which could not be true in the light of the *Meno*) but which may mean only that in his compilation of "the elements" he formulated many new διορισμοί.

Even if Plato was the first to formulate the method of geometrical analysis, however, there is no reason why he could not have done so at the time when he wrote the *Meno* as well as when he wrote the *Timaeus*. The "tradition" itself if taken seriously would imply that he "transmitted the method to Laodamas" long before he wrote the *Timæus* or even the *Theætetus*, for Laodamas, if his geometrical discoveries were the result of analysis (Proclus, *In Euclidem*, p. 211, 22-23 [Friedlein]), was presumably using the method in his fifties at the latest and he must have been fifty years old in 380 B.C. at the very latest, since he was older than Neoclides, the teacher of Leon, and Leon was himself a little older than Eudoxus (Proclus, *In Euclidem*, pp. 66, 18 - 67, 2 [Friedlein]).[60] Mugler, without observing these chronological implications, maintains, however, that "the analytic method marks the term of the evolution of the Platonic theory of knowledge" (p. 309) and that the method could not be invented until "the evolution of Plato's ideas concerning knowledge in general had transferred to the highest plane of the geometrical *a priori*, under the form of an instantaneous vision of the relations which enter into the solution of a problem, that connection of the parts to which he assigns" in the *Meno* "a function still equivalent if not subordinate to the *a priori* representation of the elementary spatial properties" (p. 401). This evolution, he asserts, though it is revealed in the modifications of the theory of reminiscence in the *Phædo*, the *Phædrus*, and the *Republic*, is not completed until Plato has conceived the metaphysics of time in the *Timæus*. The doctrine of time in the *Timæus* aside, the interpretation of the *Meno* which this implies and with it the interpretation of Plato's early metaphysics and epistemology are demonstrably false. Mugler has adopted the theory of Klara

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[60] Assuming that Proclus's "younger" and "a little younger" indicate a difference of only five years and that Neoclides was only twenty years older than his pupil, Laodamas would have been born about 430, if von Fritz's date of 400 for the birth of Eudoxus is right, and about 438 if Eudoxus was born in 408 as Heath and others maintain (cf. Michel, *De Pythagore à Euclide*, pp. 234-5). The order of names given by Proclus (*In Euclidem*, p. 66, 15-16) would imply that Laodamas was older than Archytas.

Buchmann that reminiscence in the *Meno* is not reminiscence of the ideas but is only the fragmentary memory of experience gained in an earlier incarnation, and he has made of the words ἓν μόνον in *Meno* 81 D 2 a metaphysical concept in a fashion similar to that in which he elevated the harmless πάντα ταὐτὰ of Proclus to a profound metaphysical doctrine (pp. 301-3, 309-10, 364-374). Buchmann's misreading of the *Meno* was exposed long ago;[61] here it is sufficient to observe the conclusions drawn from the interrogation of Meno's slave (86 A - B): he must have had the knowledge now recalled "when he was not a human being", his soul must therefore have known it throughout all time (τὸν ἀεὶ χρόνον), and the truth of realities is forever in our souls.[62] This passage, which Mugler fails to mention, is by itself conclusive proof that in the *Meno* reminiscence is not of earlier bodily experience but of the ideas exactly as it is in the *Phædo*,[63] the *Phædrus*, and the *Timæus* and that from the *Meno* to the *Timæus* there was no such evolution of Plato's theory of knowledge as that upon which

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[61] Cf. *A.J.P.*, LVIII (1937), pp. 497-500. Like Buchmann Mugler fails to see the irony of θεία μοῖρα in the *Meno* and the fact that it involves an *aporia* which Socrates expressly emphasizes at the end; and *Politicus* 278 C - D alone is enough to show that what is said of ἀληθεῖς δόξαι in the *Meno* does not distinguish Plato's doctrine at that time from his doctrine in the latest dialogues. The ἓν μόνον in *Meno* 81 D 2, of which Mugler makes so much, is the statement of a minimal case ("nothing prevents a man who has recalled only one thing from rediscovering all the rest by himself"); it is an answer to Meno's lazy desperation not a dogmatic statement of the fragmentation of reminiscence.

[62] ἡ ἀλήθεια τῶν ὄντων (86 B 1) can refer only to knowledge of the ideas (cf. *Phædrus* 247 C 8, 248 B 6, 249 B 5-6).

[63] The reference to the *Meno* in *Phædo* 72 E - 73 B shows that Plato never conceived that anyone could suppose the doctrine of reminiscence in the latter dialogue to be "new" and different from that in the former. In *Meno* 81 D 4-5 he formally declares that *all* learning is ἀνάμνησις. Consequently learning in a previous incarnation must have been ἀνάμνησις too; and that Plato would have been aware of this and could not have fallen into the infinite regress implied by Mugler's interpretation (p. 369) follows from the fact that in an earlier dialogue (*Lysis* 219 C - D) he had already concluded from the danger of such a regress the necessity of assuming an ultimate term of which the others that have the same name are merely εἴδωλα, i.e. he was already using the argument from regress to establish the necessity of the doctrine of ideas.

Mugler bases his "history" of the development of Plato's mathematical philosophy.

One eloquent example will show the irresponsibility of this "historical reconstruction." The expression used at *Republic* 510 D in the description of the deductive procedure of geometers, *τελευτῶσιν . . . ἐπὶ τοῦτο οὗ ἂν ἐπὶ σκέψιν ὁρμήσωσι*, is according to Mugler (p. 292) an anticipation of the relation that Plato was later to establish between geometry and dialectic and of the importance which intuition was to play in that connection, for *ὁρμήσωσι* calls up the figure of the hunt, a figure which Speusippus and Proclus after him in full knowledge of the Platonic theory used to characterize the research for geometrical truth, and "one sets out to hunt only that which one already knows." This conception, he says, just glimpsed here in the *Republic* matures in the metaphysical dialogues but will become fertile for geometrical method only with the theories of time and space in the *Timæus*. If it is valid, however, to draw such inferences from the expression in *Republic* 510 D and the figure of the hunt used by Speusippus and Proclus, then what Mugler calls Plato's final conception of the relation of geometry and dialectic and the ultimate stage of his theory of knowledge, though only "anticipated" in the *Republic*, were fully developed when Plato wrote the *Euthydemus*, a dialogue earlier than the *Republic* and roughly contemporary with the *Meno*.[64] In *Euthydemus* 290 B - C, a passage left unnoticed by Mugler, geometers, astronomers, and arithmeticians are expressly called hunters, "for they are not engaged in creating figures but in discovering those that really exist — and inasmuch as they do not know what use to make of them themselves but only how to hunt them, they — at least those among them who are not entirely foolish — hand over their discoveries to the dialecticians to employ." It is very strange to reconstruct the development of Plato's mathematical philosophy without even mentioning this passage which, written early in his career, expresses succinctly and

[64] For the relative date of the *Euthydemus* cf. C. Ritter, *Platon*, I, p. 273; Friedländer, *Platon*, II, p. 179, n. 1; Méridier, *Euthydème*, Notice, pp. 140-2; Robin, *Platon*, p. 41.

vividly so much that reappears unchanged in his latest remarks on the subject.

Even the attitude towards "geometrical construction" revealed in this passage was never altered by Plato — so far as there is any evidence to show. Mugler maintains, to be sure, that in the *Republic* Plato banished "problems" and operations of construction from geometry, that this had been his attitude when he wrote the *Meno* and the *Phædo*, but that in the later dialogues and particularly in the *Timæus* the rehabilitation of motion and becoming removed from suspicion the procedure of construction and made possible its "restoration to honor" (pp. 269-77, 293). Now, this supposed "rehabilitation of becoming" in the later dialogues is more than dubious; [65] but it is in any case irrelevant to the question of Plato's attitude towards problems and construction, for even in the earlier dialogues he did *not* seek to banish this method from geometry. Mugler's belief that he did derives from a misunderstanding of *Republic* 527 A - B, where it is said that geometers speak ludicrously of "squaring," "applying," "adding" and the like as if they were engaged in action and were carrying on their discussion with a view to action.[66] This way of talking is ludicrous, Plato says, because it is in contradiction to the purpose of geometry which is knowledge and the object of

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[65] That the reality of motion is not "new" even to the *Phædrus* I have shown in *Aristotle's Criticism of Plato and the Academy*, I, pp. 433-7, p. 451, and n. 396. On the other hand, the doctrine that accurate truth about the world of becoming is impossible was never stated more emphatically in the earlier dialogues than it is in *Timaeus* 51 E - 52 A and in *Philebus* 59 A - B.

[66] Mugler, pp. 265, 269-70, 272, 273; cf. the similar misinterpretation of this passage by E. Hoffmann in Zeller, *Phil. Griech.*, II, 1 (1922), p. 1097 and Shorey's correction of this mistake in his *Plato's Republic* (L.C.L.), II, p. 171, n. *f*. Mugler (p. 270) goes so far astray as to suppose that when Aristotle in *Physics* 200 A 24 says that in mathematics there are no πράξεις he is maintaining a Platonic thesis of an earlier period later abandoned by Plato himself; but Aristotle of course by this means not that *constructions* have no place in geometry but simply that the purpose of mathematical reasoning is not production or activity but knowledge (cf. *Eth. Nic.* 1103 B 26-31; *Eth. Eud.* 1214 A 8-12). For this distinction cf. *Charmides* 165 D - 166 A and Shorey, *Class. Phil.*, XXIV (1929), p. 312.

which is therefore eternally existent. By this, however, he neither says nor means that either these operations or even these terms should or could be banished from geometry. The contradiction between the language and the purpose of the science he represents as something that all geometers will admit; and, when he calls their language ludicrous, he says in the same breath that it is unavoidable.[67] Far from pronouncing an interdiction upon problems of construction, he recommends in *Republic* 530 B that astronomy be pursued as geometry is by the use of problems and later (531 B - C) criticizes both astronomers and students of harmony for not using this method. That Socrates in his interrogation with Meno's slave does not employ geometrical construction in the classical sense (Mugler, p. 274) is irrelevant; the example given in *Meno* 86 E ff., *ἐς τόνδε τὸν κύκλον τόδε τὸ χωρίον τρίγωνον ἐνταθῆναι* is a "problem" as Proclus defines the term (*In Euclidem*, p. 79, 20 ff. [Friedlein]), and Socrates certainly gives no indication that he disapproves of the geometers' use of such procedure. *Phædo* 101 C, which Mugler interprets (p. 275) as a prefiguring of the supposed interdiction in the *Republic*, has nothing to do with geometrical procedure at all but refers to the doctrine of ideal numbers,[68] which Mugler does not even mention, although it is certainly one of the most important parts of Plato's mathematical philosophy. Even the story which Plutarch repeats (*Marcellus* XIV, 5-6; *Quæst. Conviv.* 718 E - F) says not that Plato rejected problems or operations of construction but that he objected to the use of mechanical contrivances in the solution of geometrical problems. Just so the *Euthydemus* says not that the geometer should refrain from constructing figures but that in doing so his purpose is not to create the figures that he constructs but to hunt down those that already and truly exist.

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[67] *λέγουσι μέν που μάλα γελοίως τε καὶ ἀναγκαίως*. For the meaning of *ἀναγκαίως*, which is almost universally mistranslated, cf. Shorey, *Plato's Republic* (L.C.L.), II, p. 170, n. *b* and to his references add *Laws* 687 C 10-11, 872 E, Timaeus Locrus 104 D.

[68] Cf. Cherniss, *Aristotle's Criticism of Plato and the Academy*, I, pp. 517 ff. and *The Riddle of the Early Academy*, pp. 34 ff.

This view of the nature of mathematical reasoning and its object, the doctrine that the meaning of the entities which the mathematician discovers is not his province but that of the dialectician, and the concomitant distinction between mathematician and dialectician remained firm and unaltered convictions of Plato's at least from the period during which he wrote the *Euthydemus* to that of the last of his writings, the *Philebus*, and the *Laws*. It is as likely as any conjecture of the kind can be that, whatever encouragement of suggestion and criticism he may have given to the mathematical specialists whom he knew and despite his interest in their reasoning and his enthusiasm for the propædeutic value of their discipline, he would have insisted that the sphere of his own activity was dialectic and not mathematics and would have repudiated such attempts as that of Dr. Mugler to obliterate the distinction between the two or to reverse the order of importance which he had assigned them even for the generous purpose of magnifying his reputation in modern eyes by pretending that he was not merely a philosopher but also and primarily a productive mathematician.

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# PHILOSOPHY AND LANGUAGE

The entire history of philosophy resounds with warnings about how misleading language is, and that thinkers must beware lest they be deceived by its accidental features. Passages to this effect can be found in the writings of Plato and Descartes, Locke, Berkeley, and Hume, to name but a few of those who viewed language with alarm. Today words are viewed with as deep a suspicion as ever. Yet the hope seems perennial that agreement can be achieved on questions of language, and that when it is, this will lead quite easily and directly to the resolution of philosophical difficulties and disagreements.

But the argument goes just as readily in the other direction. If agreement about language would entail philosophical agreement, then philosophical disagreement must entail disagreement about language. It is true, of course, that a discussion which is explicitly concerned with language may apparently achieve greater clarity and precision than one which is frankly and avowedly about substance and existence, universals and particulars, or the other traditional items of philosophical controversy. But until the implications of language theories for philosophical problems are laid bare, nothing of strictly philosophical interest is accomplished. And when it is seen what philosophical theses do follow as consequences of alternative theories about language, the apparent gain in clarity may turn out to be merely apparent. In other words, when we seriously address ourselves to the solution of linguistic problems, we must bring to bear on them not just a packet of new utensils especially fabricated for that purpose, but all the old techniques of philosophical inquiry — those traditionally used by the great philosophers. There is a dialectic involved here: if facts about language can and must be utilized to acquire philosophical truths, it is no less the case that philosophical truths must and can be used to discover the facts about language.

The inevitability of this dialectical interplay between language and philosophy is revealed in the difference between

promise and performance in Professor Max Black's recent book *Language and Philosophy*.[1] That volume consists of ten essays, which, we are told in the Preface, "... are intended to show how linguistic considerations are relevant to some philosophical problems" (p. ix). Yet only three of his essays are explicitly concerned with the application of linguistic considerations to traditional philosophical problems. All his essays except the first, third, and fourth are concerned with language theories, to whose problems philosophical considerations are applied. And yet this is not done in an altogether satisfactory fashion. In Professor Black's fifth essay, in his discussion of logical constructions and Russell's search for the "ultimate constituents of the world," the interconnection between philosophy and language appears very clearly. On Black's account, Russell's doctrine of definite descriptions was motivated primarily by the desire to avoid commitment to Meinong's realms of semi-existence, populated by referents of such phrases as "the golden mountain," "the present king of France," and "the round square." That there are such realms, and that they have inhabitants, are inferences drawn from the meaningfulness of the phrases quoted. This is offered as evidence for the assertion that "... the English language, as now used by philosophers, offends by provoking erroneous metaphysical beliefs" (p. 113). It is implied that Russell's theory of descriptions permits him to say, without using such phrases, everything which prior to his analysis seemed to require the use of the phrases in question. Russellian *translations* thus provide "... a permanent protection ... against the blandishments of grammatical analogy which lend the doctrine of Realms of Being its spurious plausibility" (p. 126). But an objection may be made: If normal usage implies the quasi-being of certain entities, and Russellian translations do not, then the proposed translations are incomplete. Lacking only the Meinongian implications, they are acceptable to anyone who does not agree with Meinong's conclusions. But how does Meinong feel about the matter? Professor Black seeks to get round this

[1] *Language and Philosophy*. By Max Black. Ithaca: Cornell University Press, 1949.

objection by affirming that the theory of descriptions is a "Metaphysically Neutral Technique of Translation" (p. 125). That he is mistaken is clear, for if it were metaphysically neutral, it would be without philosophical interest. However, its importance to grammarians proper is almost nil. Its discussion has been confined exclusively to philosophical circles. Professor Black argues his thesis by claiming that the equivalence of two English sentences is to be settled by "... more or less explicit and direct appeal to congruence of behavior and linguistic utterance in cognate situations" (p. 126). But even on a crude behavioristic level there is a difference in "linguistic utterance in cognate situations." Granted not the truth but merely the significance of "The present king of France is married," (p. 125) Meinong would say that *therefore* "... the present king of France has some shadowy mode of participation in the world..." (p. 124). But granted the significance of "Exactly one thing at present reigns over France, and nothing that reigns over France is not married," (p. 125) what would he say? If he refrained from drawing his previous conclusion, the sentences are not equivalent; while if he drew the same conclusion, nothing would have been gained. Professor Black's claim that "The criteria [for equivalence of sentences] are of a sociological order ..." will succeed in making questions of meaning philosophically neutral only by excluding from society those philosophers who disagree! And so philosophical neutrality is guaranteed only by an *argumentum ad baculum*.

That theories about language are just as debatable as philosophical theories is shown even more clearly in Black's controversy with Russell over the theory of meaning involved in his method of logical constructions. Russell's basic claim here is quoted from an early article as: "... in every proposition that we can apprehend (i.e., not only in those whose truth or falsehood we can judge of, but in all that we think about) all the constituents are really entities with which we have immediate acquaintance." In this connection Black refers to the unsuccessful efforts of the phenomenalists "... to prove that words denoting material objects are dispensable ..." (p. 134). In fact, although Black does not make the comparison explic-

itly, Russell's theory of meaning would seem to be simply a linguistic version of Hume's epistemological theory that "... all our ideas are nothing but copies of our impressions ..." And if they *are* equivalent, to settle the one requires consideration of the same factors needed to settle the other. The linguistic approach to philosophy requires supplementation by the philosophical approach to linguistics.

In Russell's reply to Black, Russell explains his meaning theory in these words: "To say that we can understand without acquaintance seems to me equivalent to saying that we can acquire a habit without ever being in situations such as would give rise to it." Black interprets this as meaning "... to say that the meaning of a sign was known by acquaintance would be to say *only* that we had at some time learned to use it by applying it to instances" (p. 252). But it seems to me that Russell's reformulation is a tremendous step away from his previous Humean position. One can acquire proper habits of usage for the word "God" by regular attendance at church or Sunday School — for these situations give rise to the habit of such usage. This is a far cry from the claim that only a mystic who has *seen* God could use His Name. Black does not seem to have noticed that the earlier position has been abandoned. Acquiring a habit by being in situations which give rise to it is far different from "applying (a sign) to its instances." This latter is the Humean epistemology in linguistic guise (at least we have Black's word that he is discussing "Russell's Philosophy of Language"), and it is amazing to find as shrewd a critic as Black writing that he "... cannot see that there are any important philosophical uses of this sense of 'acquaintance'" (p. 252).

It seems clear, then, that there is a significant connection between philosophical theories and linguistic ones. Moreover, it is apparently the case that there is a genuine equivalence between some philosophical theses and some linguistic ones. It has been urged that this equivalence is universal, that to every philosophical theory that has any significance at all, there is a linguistic thesis which is strictly equivalent to it. The legitimacy of this claim will be considered presently, but first it will be interesting to examine an inference which many phi-

losophers of language have drawn from it. It is urged that philosophical doctrines, especially metaphysical doctrines, to the extent that they have any cognitive content at all, are *really* linguistic theories in disguise. Every metaphysical thesis that has any meaning, it has been claimed, is *really* a thesis concerning language. This is asserted by Professor Philipp Frank, who writes:

> ... if we ask whether the physical world consists of bodies situated in space... we have formulated the question in the "material idiom" or "material mode". So formulated, it leads to innumerable disputes of a metaphysical character. We can avoid such disputes by stating the question in a consistently scientific form, using the "formal idiom". When so stated it becomes the following: Do the fundamental propositions of physics (i.e., its most general laws) contain only terms of the thing-language, or do they contain also terms that do not occur in the thing-language ? [2]

In his recent book, *Elements of Analytic Philosophy*, Professor Pap makes a similar claim for the advantages of the linguistic or "formal mode" of expression. Philosophical statements about metaphysical categories, being in the material mode of speech, are mere pseudo-object statements, which *ought* to be expressed in the formal mode as statements about syntactical categories. Instead of saying that "walking is a process" we should say that " 'to walk' is a verb." [3] Professor Pap suggests that such concepts would be "... more appropriately called *quasi-syntactical*" (p. 408). But even if it were true that there is an equivalence between some philosophical categories and doctrines, on the one hand, and linguistic categories and doctrines, on the other, the conclusion that one is more 'real' or more 'proper' or more 'appropriate' than the other would be doubtful. In fact, *if* there were really an equivalence, this would show the conclusion to be literally senseless. It is as if one were to claim that there is an equivalence or identity between sofas and couches (which would be unobjectionable, of course), and then to go on and say that there are *really* only couches, that to speak about sofas is only the result of confusion, and

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[2] *Modern Science and its Philosophy*. By Philipp Frank. Cambridge: Harvard University Press, 1949. P. 152.

[3] *Elements of Analytic Philosophy*. By Arthur Pap. New York: The Macmillan Company, 1949. P. 306.

is a vain and wicked thing to do. How much sense would it make to say that statements about sofas are really pseudo-statements, that if only we saw the light we should realize them to be *quasi-couchical*? Even granted the alleged equivalence, it seems clear that the confusion is not on the part of metaphysicians but rather belongs to their critics. If there is really an equivalence here, then philosophical arguments relevant to the truth or falsehood of metaphysical doctrines would be relevant to deciding disputes about language, and, moreover, arguments for or against an apparently 'pure' theory of language would be fraught with profound metaphysical significance. Contrary to Professor Frank's pious hope, metaphysical disputes would not be so easily avoided by this inexpensive linguistic legerdemain, even if the alleged equivalence held.

Granting the equivalence, it might be urged that the "formal mode" is superior in being *psychologically clearer* than the material mode. This, of course, is an empirical claim, which if intended seriously would require the introduction of empirical psychological data as evidence. To the best of my knowledge, no relevant data have ever been adduced — which omission is not without significant implications concerning the extent to which self-styled logical empiricists are in touch with the methods of science.

But does the asserted equivalence really obtain? Does every significant metaphysical theory correspond to some theory about language? The attempt to interpret philosophical doctrines as theories about language is made by several writers in the new volume of essays *Philosophical Analysis*.[4] One of the most careful is that of Professor Paul Marhenke in his examination of Phenomenalism.[5] Minutely distinguishing between the formal and material modes of speech, between genuine and pseudo-objects sentences, Professor Marhenke observes that "Contemporary phenomenalists remove the air of paradox from the thesis of phenomenalism by adopting the formal mode of speech" (p. 300). Consequently, using Marc-Wogau's ter-

[4] *Philosophical Analysis*. A Collection of Essays. Edited by Max Black. Ithaca: Cornell University Press, 1950.

[5] *Ibid.*, pp. 299-322.

minology in which an "M-sentence" is any statement containing the name of a physical object and an "S-sentence" is any statement containing the names of sense-data but not the names of physical objects, Professor Marhenke formulates the thesis of phenomenalism as: "Every M-sentence is analyzable into (synonymous with) an S-sentence" (p. 301). After a painstaking examination of a great many objections to the thesis, in which the benefit of doubt seems to be given it on every possible occasion, the conclusion is drawn that — as stated — ". . . the thesis of phenomenalism must in any case be rejected as untenable" (p. 321). Professor Marhenke rejects the thesis of phenomenalism — in its formal statement — because ". . . it is logically impossible to construct the S-sentence that corresponds to a given M-sentence. An M-sentence therefore necessarily differs in meaning from every S-sentence" (p. 321). But now comes a surprise. Although no M-sentence is translatable into or synonymous with an S-sentence, ". . . we are not entitled to conclude that the analysis of an M-sentence yields a residue of meaning that is not expressible as an S-sentence" (p. 322). This would seem to make sense only if physical objects *are* just collections of sense data. An alternative definition is suggested, *not* syntactical this time, and it is written that ". . . if this is the definition, the thesis of phenomenalism becomes indistinguishable from the fundamental principle of empiricism that everything we can know and mean must be verified and exemplified in the directly observable" (p. 322). I hope I am not misinterpreting Professor Marhenke when I understand him to be affirming the latter doctrine. (Of course it is well known that phenomenalism is simply the most radical and thoroughgoing version of empiricism, but this is the phenomenalism of the denigrated material mode of speech.)

It follows from these considerations that the various classical formulations of phenomenalism, that physical objects are "congeries of sensible impressions," or "bundles of ideas," or "classes of sense data," are not in the least affected by the demonstrated untenability of the linguistic or syntactical formulation of phenomenalism. Although an infinitely long sentence is not a sentence at all, an infinite class of sense data is still a class of sense data. In other words, the fate of the phe-

nomenalist thesis as stated formally is immaterial to the truth or falsehood of the thesis as traditionally set forth. Since the traditional statement of the thesis is in the *material* mode of speech, then perhaps a more revealing name for the formal would be the *immaterial* mode of speech.[6] Since it does not fairly express what is intended, it is readily seen how the careless use of the immaterial mode of speech can lead easily to deception and self-deception. Since it does not yield a formal thesis about language which is really equivalent to the metaphysical issue about the nature of the facts, perhaps it would be appropriate to characterize its sentences as *quasi-factual*. The shoe is now on the other foot. And it should be noted that these deliberately abusive terms are being applied not to linguistic doctrines which are equivalent to metaphysical ones, but to those which *pretend* to be but which really are *not*. It follows that contemporary phenomenalists do not remove *only* the "air of paradox" from the thesis of phenomenalism by adopting the immaterial or quasi-factual mode of speech. They also remove any plausibility the thesis of phenomenalism might conceivably possess. (It has not been sufficiently remarked that the language philosophers' two claims, one, that some metaphysical statements are equivalent to statements about language, the other, that all metaphysical statements are "cognitively meaningless," [7] are inconsistent with each other. This attempt to eat one's cake and have it too is not becoming to any writer, especially not to those whose continual emphasis is upon "clarity." Or is the contradiction to be resolved by asserting that some statements about language are themselves meaningless?)

The alleged equivalence between philosophical doctrines and linguistic theses is thus seen not really to obtain. But even if it did, would this really permit an unmetaphysical resolution of metaphysical disputes? If, for the sake of argument, we grant the claim that every significant philosophical theory can be reformulated as a theory of language, what would

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[6] "Revealing," that is, in the sense of Wilde's epigram to the effect that nowadays to be intelligible is to be found out.

[7] *Elements of Analytic Philosophy*, p. 324, n. 18, and *passim*.

follow? Let us discuss this in terms of the positivists' own (favorite) example. Professor Frank writes:

> Consider, for example, the ancient puzzle whether the world is essentially mind or matter, the answer to which has been the shibboleth for distinguishing between idealists and materialists. Schlick would reformulate the problem: Are mental concepts or physical concepts better suited to build up a system of symbols that could indicate the world of facts uniquely? The problem loses its yes-or-no character and becomes a problem of deciding, on grounds of convenience, between two ways of describing the facts of the world (p. 30).

And he says much the same thing, perhaps more clearly, in another passage:

> ... according to the doctrine of logical empiricism, the question to be put was not whether idealism and materialism were right opinions about the real world, but only what language, phenomenal or physical, was the more suitable for giving an economical and unitary account of our experiences (p. 86).

Now the advantage alleged to accrue from adopting this linguistic point of view is clear. We need no longer bother to consider questions about the facts themselves, we need only be concerned to choose between alternative languages for describing the facts. But by what criterion shall we decide which of alternative languages to adopt? It cannot be a merely linguistic one, for this would be a circularity of the most vicious type. Professor Frank is candid about this matter: he admits clearly that the criterion for choosing between alternative languages is convenience or suitability. I understand him to be here suggesting a pragmatic test. A language, after all, is an *instrument* for performing certain tasks, and we choose between languages, as between any other instruments, on the grounds of their adequacy and convenience for the use we wish to make of them.

The analogy of the instrument is helpful. Given an iron bar to cut, and a choice between a penknife and a hacksaw as instruments, it will require no great mechanical genius to discover that the hacksaw is much more convenient and suitable. From our knowledge of the instruments, and their different degrees of adequacy here, we can surely draw the "ontological" conclusion that the bar is *hard* rather than *soft*.

Is this inference to be forbidden? I think not. My point here is that questions of the relative convenience of alternative languages for describing the facts are not entirely divorced from questions about the facts themselves. To pretend otherwise is not without its humorous aspects. One might imagine a couturier delicately speaking of a sensitive customer, and the problem of fitting her with a gown. He admits that he is *unsuccessful* in attempting to cover her with dresses from any rack other than that marked "Size 40," and that attempts to use "instruments" from the Junior Miss Department lead to *failures* that may justly be called catastrophic. Can we infer that Madame is therefore fat? Heaven forbid, that inference is illegitimate and unspeakable — it is too grossly "material" a mode of speech! But the universe is not a vain capricious customer of ours. If the shoe fits, this is a good clue to the size of its foot. If a language is adequate to describe it, this indicates something about its structure.

The point is that questions about convenience are factual questions in two senses. That a hacksaw is more convenient than a penknife for cutting an iron bar is a *fact*, explicable by reference not only to the properties of the instruments and our subjective hopes and fears, but to the *fact* that the bar is hard and tough. The pragmatic doctrine goes too far. If consistently applied, it will rule out not only metaphysical theories, but physical theories as well. One is left not with science without metaphysics, but without science at all. One is left in a subtly vicious regression of adoptions which are not convenient, but which it is convenient to regard as convenient — that is, which it is convenient to regard as convenient to regard as convenient — or rather, etc., etc. To break through the regression with respect to science, one must make a frankly physical statement, and to break through with respect to metaphysics, one must make a frankly metaphysical statement. Even to deny this is as much a matter of metaphysics as of logic or analysis.

Let us conclude with a summary statement of the salient points that have been made. The suggestion that linguistic considerations can help settle philosophical problems was challenged on the grounds that questions of language, that is, significant questions of language, require philosophical consider-

ations for their discussion. This means that linguistic considerations can be decisively applied to philosophical questions only if some philosophical questions have already been decided. It was further shown that translating some philosophical problems into the formal mode of speech achieves a clearer formulation, but not of the original questions, so that any decision with respect to the derived question is immaterial to the truth or falsehood of any philosophical theory concerning the original problem. And finally it was urged that adopting the pragmatic criterion of convenience for deciding between alternative languages leads to the rejection of science as well as of philosophy. This should not be taken to imply that the discussions of linguistic philosophers are worthless, for (as was observed of Professor Black's own book, and as is true of Professor Pap's book also and of Professor Marhenke and in fact of the majority of the contributors to *Philosophical Analysis*) the more competent of them do not really work within the limits they proclaim to be correct. Much of what they say is of philosophical interest and importance. But this is achieved by flouting rather than by following their "official" methodology.

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# A RHETORIC OF MOTIVES *

*A Rhetoric of Motives* is an impressive book. It is the second member of a trilogy of which *A Grammar of Motives* was the first member, and which a third work, *A Symbolic of Motives*, will complete. The *Grammar* dealt with the most general ways in which words can be used; the *Rhetoric* seeks the underlying motives for which words are strategies; the *Symbolic* will probe the various value-orientations that lie behind the motives disclosed in the *Rhetoric*. Burke's trilogy is a sustained attempt to uncover human motivations through an analysis of their linguistic expressions. This is a large task, and carried out in a masterly manner. Writers, critics, linguists, psychologists, and philosophers all stand to gain from the discerning analyses, the freshness of insight, and the richness of fare which these volumes of Burke provide.

Burke approaches man in terms of human actions. His key concepts — elucidated at length in *A Grammar of Motives* — are act, scene, agent, agency, and purpose. Men are viewed as agents acting in a scene and using some agency for the accomplishment of some purpose. This is a "field" orientation of the sort found in George H. Mead's "philosophy of the act," in Edward C. Tolman's "purposive behaviorism," and in Talcott Parson's concept of "action-system." Burke makes many references to Mead, and his approach to man is very similar to Mead's in its stress upon the act, upon man as a symbol-using agent, and upon the forms of "identification" which role-taking (via symbols) makes possible. The focus of Burke's attention is, however, upon man's literary products as a mirror in which to behold the forms and complexity of human motivation. He is in effect telling us — and showing us — the importance of the study of man's most complex symbolic acts as a way of enriching our understanding of human nature. In the *Rhetoric*, humanistic material is penetratingly analysed in a way which supplements and broadens the conception of man gained from more narrowly scientific

* *A Rhetoric of Motives*. By Kenneth Burke. New York: Prentice-Hall, Inc. 1950. Pp. xiv + 340. $5.00.

studies. In his discussion of the range and the principles of rhetoric Burke considers Cicero, Aristotle, Augustine, Bacon, Bentham, Marx, Carlyle, Empson, Veblen, Diderot, La Rochefoucauld, De Gourmont, Pascal, Ovid, Machiavelli, and Dante. Of his analyses of literary works the pages on Castiglione, Shakespere, Kafka, and Kierkegaard are very fine. That no student of man should neglect this humanistic material or this mode of linguistic analysis is convincingly attested by Burke's achievements.

For Burke, as for Mead and Cassirer, "man, *qua* man, is a symbol user" (p. 136), and his symbolic acts are an essential part of his total action. Poetic language is "a kind of symbolic action, for itself and in itself"; scientific language is "a preparation for action"; rhetorical language is "inducement to action (or to attitude, attitude being an incipient act)" (p. 42). Burke argues at length that the rhetorical use of language cannot be dispensed with; man as man must use symbols rhetorically to persuade others (and himself) in such ways that distinctively human acts can be carried out.

Burke does not have, to be sure, a carefully developed semiotic, and he does not give a very precise differentiation of the rhetorical, the poetic, and the scientific features of language. Perhaps this stems from the fact that he does not explicitly distinguish the significations of words from their uses. While scientific utterances are said to be "preparations for action," they are also regarded as descriptions of "how things are, in strictly 'scenic' terms"; the formulation "purely scientific statements, or preparations for action" (p. 41) seems to identify these two conceptions. The result is vagueness as to the relation of the rhetorical, the poetic, and the scientific. Burke writes that "the application of the notion of persuasion to *attitude* would permit the application of rhetorical terms to purely *poetic* structures" (p. 50); and he attempts to show how "out of persuasion, we can even derive pure *information*, which is usually *contrasted* with persuasion" (p. 177). Perhaps Burke is maintaining that the persuasive use of language is the primary use out of which the other uses (and hence the other modes of discouse) develop; but the matter is not entirely clear.

Burke expands the classical treatment of rhetoric in terms of persuasion by giving emphasis to the notion of identification. "You persuade a man only insofar as you can talk his language by speech, tonality, order, image, attitude, idea, *identifying* your ways with his" (p. 55). But it is hard to pin down just what Burke means by his key term "identification," or its relation to persuasion. At times identification seems little more than to take into account the point of view of the audience addressed; at times it seems to be the relation of an act to a larger unit of action of which it is a part; for the most part it seems to involve sharing, via symbols, the values of the person or audience with whom one is communicating. It is significant that Burke omits consideration of "polemic kinds of rhetoric (such as the verbal tactics now called 'cold war')" (p. xiv); his concern is for the rhetorical processes involved in "the courtship of classes," in "mystification," in "hierarchy," and in "pure persuasion." This limitation of attention to rhetorical processes in which shared values are prominent restricts considerably the range of human motives which Burke uncovers, but it has the merit of concentrating attention upon subtle and complex forms of motivation which the traditional rhetoric largely left untouched.

According to Burke there are three main kinds of terms, forming a verbal hierarchy: the positive, the dialectical, and the ultimate. Positive terms (such as 'tree' or 'house') name "a manifold of sensations united by a concept" (p. 183); dialectical terms (such as 'rights' or 'principles of positivism') are the "fictitious entities" of Bentham — they belong "not in the order of *motion and perception*, but rather in the order of *action and idea*" (p. 184); ultimate terms (such as 'God' or Plato's 'the God') put things in "a *hierarchy*, or *sequence*, or *evaluative series*," and so involve a "guiding idea" or "unitary principle" (p. 187).

Burke maintains that positive terms (and hence the positive sciences) are "not enough," but are only the base of a terminological pyramid. Dialectic and ultimate terms — so the argument runs — arise from and are made necessary by the place that symbolic processes play in human nature. Burke is thus proposing that there are "purely symbolic motives":

"When we use symbols for things, such symbols are not merely reflections of the things symbolized, or signs for them; they are to a degree a *transcending* of the things symbolized. So, to say that man is a symbol-using animal is by the same token to say that he is a 'transcending animal.' Thus, there is in language itself a motive force calling man to transcend the 'state of nature' (that is, the order of motives that would prevail in a world without language, Logos, 'reason')" (p. 192). Hence it is to the nature of man as *animal symbolicum* (to use Cassirer's term) that Burke ultimately appeals in order to explain, and to justify, kinds and uses of signs other than those which appear in science. Philosophy, art, and religion, when so approached, are seen to arise from, and minister to, needs due in part at least, to the symbolic process itself.

As an illustration of this point, consider Burke's doctrine of "pure persuasion," perhaps his most novel contribution to the "New Rhetoric." "Pure persuasion involves the saying of something, not for an extra-verbal advantage to be got by the saying, but because of a satisfaction intrinsic to the saying. It summons because it likes the feel of a summons. It would be nonplused if the summons were answered" (p. 269). Or again: "Persuasion in all purity would transform courtship into prayer, not prayer for an end, but prayer for its own sake, prayer as Adoration, or as the Absolute Compliment" (p. 252). Thus by an appeal to needs intrinsic to the symbolic process Burke attempts to show how the need for restraint, for an "athleticism of self-denial," arises, and why man out of his very nature carries on an indefinitely extended dialectical activity that formally perfects itself by the introduction of an "ultimate" term (a "god-term").

Burke makes clear that "we are not discovering 'God' here, in the theologian's sense" (p. 276). As rhetorician he is attempting to show by an appeal to human nature how dialectic and ultimate terms, and the rhetorical and poetic uses of language, arise, and why they are indispensable. This, Burke admits, is as far as one can go by a study of rhetoric.

Whether one can go farther or not, and in what sense, Burke does not here say. He may seem to. The concluding words of *A Rhetoric of Motives* are these: "And finally let us

observe, all about us, forever goading us, though it be in fragments, the motive that attains its ultimate identification in the thought, not of the universal holocaust, but of the universal order — as with the rhetorical and dialectic symmetry of the Aristotelian metaphysics, whereby all classes of beings are hierarchally arranged in a chain or ladder or pyramid of mounting worth, each kind striving towards the *perfection* of its kind, and so towards the kind next above it, while the strivings of the entire series head in God as the beloved cynosure and sinecure, the end of all desire."

How are these words to be taken? As straight metaphysics and theology? Perhaps. But not necessarily so. Burke is resourceful; and he has revealed to us the doctrine of pure persuasion. Notice in this passage that the thoughts there persuasively presented are presented as the way in which the motive directed toward universal order, and away from the universal holocaust, finds its "ultimate identification." Whatever else they may do, these final words rhetorically disclose Burke's deepest motive, and his ultimate term. On his view rhetoric comprises "both the *use* of persuasive resources (*rhetorica utens*, as with the philippics of Demosthenes) and the *study* of them (*rhetorica docens*, as with Aristotle's treatise on the 'art' of Rhetoric)" (p. 36). Burke's *A Rhetoric of Motives*, consistent with this position, is both *rhetorica docens* and *rhetorica utens*.

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## *Notes and Observations*

# MARXISM AND SCIENTIFIC PHILOSOPHY

## I

Marx proudly claimed that his philosophy was *scientific*, accurately characterizing the mode of cognition of modern science. It rejected French materialism which so clearly reflects the Newtonian mechanism. And it rejected the romantic idealism, culminating in Hegel, which epitomized the growing attempt to reconcile the Cartesian and Newtonian antithesis between blind matter and creative mind. To retain the perceptive content from Hegel's distorting rationalization of history, and simultaneously to ground these insights on verifiable foundations in harmony with scientific fusion of experimentalism and imagination, was to modify both Descartes and Hegel. In the conception of a developing universe, open to an understanding which uses a logic of development, Marx and Engels found their dialectical materialism. In the expanding science of their day, they found its confirmation. The primitive Newtonian mechanism was inadequate to the conceptual growth of chemistry and cell biology. Dialectical change had been exemplified, in Marx's view, by Darwin's evolutionary hypothesis, in particular by the recognition that the proper subject of study consists of the entire biological diversity together with the history of that diversity; each epoch was to be specified by its physico-chemical environment as well as by biological facts. In their own pioneering, Marx and Engels found the possibility of *social* science to rest on an approach which used, *concretely*, the concepts of transformation, growth and decline, mutual interaction, quantitative variable, self-reference and self- or group-consciousness. They did not hesitate to investigate a whole society and its history in order to understand an immediate event. It is as the strategic base of science that philosophy will exist in a Marxist society, and, con-

versely, it is as the critical implementation of examined philosophy that science will progress in that society.

The elaboration of these principles has rested on the efforts of many thinkers. In presenting the scientific aspect, few have been as lucid and as aware of fundamental issues as the British physicist, J. D. Bernal. Aside from the Soviet tradition, which derives so largely from Lenin's work of critical re-statement, *Materialism and Empirio-criticism*,[1] little has been done to carry out what has been mainly a program, a series of brilliant *aperçus*, and a guide. In Bernal's recent writings, the attempt is finally being made to apply these principles and practice their program. His political activities, his philosophical commentary, and his research have blended in his Marxist vision of a scientific way of life.[2]

Use of a Marxist historical analysis in the understanding of scientific problems clearly does not involve a new method of experimentation nor even a new method of theoretical validation. It does entail analysis in the light of larger and historical contexts, and it involves an evaluation of priorities in the attack on complexes of problems. In Bernal's view, the role of cooperative research does not preclude the role of individual care and imagination; on the contrary, at the present stage of scientific development, it is frequently a prerequisite for the latter. It does mean that scientific planning, to avoid the dangers of

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[1] There are two English translations of this important book, that of J. Fineberg, published in *The Theoretical Principles of Marxism*, vol. XI of Lenin's *Selected Works* (New York: International Pub., 1943), and that of D. Kvitko, published as vol. XIII of Lenin's *Collected Works* (New York: International Pub., 1927) and no longer available. The philosopher who does not read Russian will find the Kvitko translation considerably clearer in many crucial passages, especially in those of an epistemological character.

[2] Bernal's major writings thus far are: *The Social Function of Science* (London: Routledge, 1939), a sociological analysis of the political role of science; *The Freedom of Necessity* (London: Routledge and Kegan Paul, 1949), selected essays on nature, man, and society; *Science in Social History* (London: Watts, in press) the concluding chapter of which was published as "The Place and Task of Science," *Science and Society 13* 193 (1949); "The Biological Controversy in the Soviet Union and its Implications," *Modern Quarterly* (London) n.s. *4* 203 (1949); and, "The Physical Basis of Life," *Proc. Phys. Soc. 62* Sect. A 537 and Sect. B 597 (1949).

blinded leadership and dulling bureaucracy, must be based on dialectical analysis of scientific principles. Now, science, as Bernal sees it, has two aspects: it is the methods of analyzing and manipulating material objects and organisms; and it is a social enterprise of individual men, responsive to their nature as social beings. Dialectical materialism is primarily concerned with the social aspect since it claims, initially, "to be the mode of thought which is most suited to dealing with events in the social fields; it was built up from observations in this field and has been the basis for successful action in it." Yet it has a fundamental role in the asocial aspect of science too, primarily in its realization that the understanding of scientific method must be more than an understanding of the rationalization of that method. Science as discovery, as logical structure, as experiment, and as technology, is a unity, complex and interdependent. Logic alone, indispensable as it is, leads to no discoveries. Despite its use in explication, it has led to barren dependence on basic concepts whose examination it seems to deny itself. But, for Bernal, here is precisely the point where the two aspects of science interpenetrate. The logical analyst's healthy desire to eliminate nonsense and obscurantism has led, on the one hand, to a refusal to consider the irreducibly non-linguistic character of primitive elements in scientific knowledge, thus dodging the issue of materialism. On the other hand, it has promoted a philosophy of particularism and partial irrationalism within science, an irrationalism with respect to the scientific analysis of social events. Analysis of the social aspect should, however, create a philosophical sociology of science. Then the view that dominant categories of scientific explanation are in harmony with philosophical concepts of the previous and contemporary society, will be joined to the recognition of the objective nature of verifiable knowledge. It is by developing a *sociology* of scientific knowledge in order to create a satisfactory Marxist *philosophy* of science that Bernal's major work may be done.

The general theory of ideology, hardly more precise today than thirty years ago, abounds in exciting ideas and stimulating (but frequently unverified) hypotheses. There is for example, no more significant criticism of the philosophy of modern

society than Christopher Caudwell's two collections of essays [3] and his *The Crisis in Physics:* [4] but as Christopher Hill has remarked, "his work, like that of the great Marxist classics, reverberates with brilliant ideas suggested rather than fully worked out." [5] Modern Marxist philosophy of science has, in its original work, been mainly critical; as a *constructive* outlook, it has been content to repair to the shelter of provocative suggestions derived from its social theory or its speculative founding works. Even the most promising of recent Marxist works on the philosophy of science merit this characterization. Such a situation can only elicit the demand that Marxist scholars should provide detailed conceptions and creative applications for their nineteenth century framework.[6] Marxist concern for the special sciences and passion for social action has led to a neglect of fundamental issues. It is not dislike

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[3] *Studies In A Dying Culture* (London: The Bodley Head, 1938; and New York: Dodd, Mead, 1949) and *Further Studies In A Dying Culture* (London: The Bodley Head, 1949).

[4] These are posthumous notes edited by Prof. H. Levy (London: The Bodley Head, 1939).

[5] C. Hill, "Historians On the Rise of British Capitalism," *Science and Society 14* 318 (1950). For an extended commentary on Caudwell, see M. Cornforth, "Caudwell and Marxism," *Modern Quarterly* (London) n.s. *6* 1 (1950-51).

[6] The allusion to recent critical works, some of high value as such, includes: H. Lefebvre, *A la lumière du matérialisme dialectique*: Tome 1, *Logique formelle, logique dialectique* and Tome 2, *Methodologie des sciences* (Paris: *Éd. sociales*, 1947 and 1950; other volumes in preparation); M. Cornforth, *Science vs. Idealism, An Examination of "Pure" Empiricism and Modern Logic* (London: Lawrence and Wishart, 1946), *In Defense of Philosophy, Against Positivism and Pragmatism* (London: Lawrence and Wishart, 1950), *The Battle of Ideas in Science* in *Science for Peace and Socialism* (London: Birch Books, 1949); "Logical Empiricism" in *Philosophy For the Future: The Quest of Modern Materialism*, ed. R. W. Sellars et al. (New York: MacMillan, 1949); J. Lindsay, *Marxism and Contemporary Science, or, The Fullness of Life* (London: Dennis Dobson, 1949); G. Lukacs, *Der junge Hegel* (Zurich and Vienna: Europa Verlag, 1948); as well as Caudwell's writings. J. B. S. Haldane's *The Marxist Philosophy and the Sciences* (New York: Random House, 1939) and H. Levy's *A Philosophy For a Modern Man* (New York: Knopf, 1938) are but the barest outlines of a modern scientific concretization of a mature Marxist philosophy.

of metaphysics [7] but a mistaken emphasis on criticism of competing thought which has brought Marxian philosophy to a plateau. Creative thinking, disciplined hypothesizing, and self-conscious use of their genetic theory of explanatory concepts, would seem to be needed. Only a full theory, which demonstrates its assertions in detail, will make the second century of Marxist philosophy as challenging as the first.

## II

In characterizing intellectual Marxism as philosophical sociology, the English-speaking reader will find strongest confirmation in the work of Rudolf Schlesinger. In a series of critical books and articles, he has written the most sensitive accounts of the subtle interplay among economic theory, social facts, personal characters, international pressures, and fundamental philosophical outlook, which determine the Soviet scene. Ranging from *The Spirit of Post-war Russia: Soviet Ideology 1917-1945,*[8] a book which is deceptively easy to read, to his massive treatment in *Marx: His Time and Ours* [9] and his technical survey of *Soviet Legal Theory, Its Social Background and Development,*[10] he has consistently adhered to the view that comprehension of a social order requires detailed understanding of its philosophy. In the case of a Marxist society,

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[7] The orthodox Marxist dislikes the word for it connotes, to him, a static idealism; what we generally mean by "metaphysics," e.g. a persistent concern with root questions and an inquiry into the nature of reality and of the knower as a vital part of reality, the Marxist denominates as dialectics, ontology, cosmology and epistemology.

[8] London: Dennis Dobson, 1945.

[9] London: International Library of Sociology and Social Reconstruction, Routledge and Kegan Paul, 1950; and New York: Augustus Kelley, 1950.

[10] New York: Oxford University Press, 1945. Another account of Soviet law and its philosophy has been given recently in H. J. Berman's fine *Justice in Russia: An Interpretation of Soviet Law* (Cambridge: Harvard University Press, 1950); the authoritative Soviet presentation is A. Y. Vishinsky's *The Law of the Soviet State* (New York: Macmillan, 1948), while the classic Marxist basis for subsequent developments is contained in Engels' *The Origin of the Family, Private Property and the State* (New York: International Publishers, 1940).

where the ideology and the philosophy tend to be identical, this philosophical basis for sociological understanding is even more imperative. Schlesinger's large treatise consistently relates each concept of the Marxist theory, from logic to political ethics, both to theoretical origins and to contemporary Communist fact.

Schlesinger has joined with J. Miller, his colleague at the University of Glasgow, to launch a new journal *Soviet Studies* [11] devoted to the "systematic study of the society developing and functioning in the Soviet Union." It is frequently of interest to philosophers, due partly to the frequent translations and critical discussions of philosophical essays which have appeared and partly to the emphasis on theory in Soviet public life. A consistent reading of the pertinent articles in *Soviet Studies*, *La Pensée* (Paris), *The Modern Quarterly* (London), and the weekly *Current Digest of the Soviet Press* (Washington) would furnish a fair acquaintance with Marxist philosophy today. The first volume of *Soviet Studies*, for example, contains: J. and M. Miller's interpretative essay on Zhdanov's speech to the congress of Soviet philosophers (pp. 40-51), translations of several Russian articles on "cosmopolitanism" (pp. 84-90 and 178-88), a detailed commentary on the first issue of the principal Soviet philosophy journal to be published by its revised editorial board, i.e. *Voprosy filosofii (Questions of Philosophy)* 1949 no. 3 (pp. 210-230), and a commentary on recent issues in Soviet psychology (pp. 343-346). Running over into volume two is a four-part critical and expository essay on current Soviet philosophy of history and historiography.

The need to recognize that the Soviet academic world places philosophy in the social sciences (indeed it makes the job of philosophy into the central one of theoretical science) is most recently exemplified in a sympathetic detailed survey of *Soviet Psychiatry* by Dr. Joseph Wortis.[12] Included in this volume are full translations of three recent Russion articles

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[11] *A quarterly review of the social and economic institutions of the U.S.S.R.* (Oxford: Blackwell, since June 1949).

[12] Baltimore: Williams and Wilkins Co., 1950.

on the conceptual foundations of psychology: M. N. Maslina, "For Bolshevik Partisanship in Questions of Psychology, a Critique of A. N. Leontiev," *Voprosy filosofii* 1948 no. 2; E. T. Chernakov, "Against Idealism and Metaphysics in Psychology," *ibid.* 1948 no. 3; V. Kolbanovskii, "For a Marxist Approach to the Problems of Psychology," *Bolshevik* 1947, no. 17. Related to these is the article by A. McPherson, "The Philosophical Aspects of Intelligence," *Modern Quarterly* (London) n.s. *4* 218 (1949).

Studies of the Marxist *Weltanschauung* have generally been political in character but there are several which deserve notice in a metaphysical journal. Sidney Hook's *From Hegel to Marx: Studies in the Intellectual Development of Karl Marx,* which, despite his highly independent interpretations, is still the most informative study in English of Marx's philosophical development, has been re-issued;[13] H. P. Adams' useful *précis* of Marx's early and most philosophical writings will be re-issued shortly.[14] The classic study of this period in Marx's intellectual life is that of A. Cornu[15] who recently wrote a briefer incisive essay on the position of Marx in modern philosophical thought since Rousseau and Kant.[16] A thorough and competent investigation of the same period was recently made by the eminent Catholic scholar, F. Grégoire.[17] A complete anthology of Marx's ethical writings has been assembled, with a lucid introduction, by M. Rubel.[18] Together with Venable's *Human Nature: the Marxian View,*[19] it provides a definitive introduction to the Marxist *Weltanschauung.*

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[13] New York: Humanities Press, 1950.

[14] *Karl Marx in His Earlier Writings* (London: Allen and Unwin, 1951).

[15] *Karl Marx, l'homme et l'œuvre: de l'hégélianisme au matérialisme historique (1818-1845),* (Paris: Alcan, 1934).

[16] *Karl Marx et la pensée moderne: contribution à l'étude de la formation du marxisme* (Paris: Ed. sociales, 1948).

[17] *Aux sources de la pensée de Marx: Hegel Feuerbach* (Paris: J. Vrin; and Louvain: Éditions de l'Institut Supérieur de Philosophie, 1947).

[18] *Karl Marx: Pages choisies pour une éthique socialiste* (Paris: Librairie Marcel Rivière, 1948).

[19] New York: Knopf, 1946.

## III

Marxism is a humanistic attempt to bring Hegelian idealism into scientific form. It is, also, chiefly through Hegel himself, the legatee of Western philosophy from Heraclitus, Plato and Aristotle to Rousseau and Kant. The transforming attempt has been questioned in its most sensitive areas by Karl Popper in his irritating, learned and stimulating treatise on *The Open Society and Its Enemies*.[20] Professor Popper has vigorously set forth the doctrine that Plato's rejection at the hands of the Periclean democrats was matched by his disastrous success in the ensuing course of Western culture. For Plato advocated what Popper (following Bergson) calls a "closed society," namely a society whose fundamental principles are unquestioned and unquestionable myths. In their false aristocratic bias and in their attitude toward the attainment of truth (including the establishment of the myths), these Platonic principles have wreaked a wreckage of irrationalism and bondage on succeeding generations. Popper's critique of Plato is a major one, original in its breadth, fervor and acid documentation; but it is the second volume, on Hegel and Marx, which strikes at contemporary world philosophies with greatest strength. Popper has developed his early researches on an empiricist philosophy of science [21] to a point which in many ways confirms Lenin's bitter attack on the Russian Machists; for Popper places Marxism in the main line of Hegelian-Platonic unreason, charges it with distortion of scientific method, and contrasts with it his plea for a program of piecemeal social engineering. In Popper's "open society," there would be realization in social practice of what his philosophy of science has declared to be the keystone of a toughminded logic of genuine knowledge: namely, that all principles and all

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[20] This work first appeared in two volumes: I. *The Spell of Plato*, II. *The High Tide of Prophecy: Hegel, Marx and the Aftermath* (London: Routledge, 1945) and has been revised for a one-volume edition (Princeton: Princeton University Press, 1950). Much of its attack depends on the analysis which Popper carried out previously in two articles: "The Poverty of Historicism" in three parts, *Economica* n.s. *11* and *12* (1944-1945), and "What is Dialectic?", *Mind*, n.s. *49* (1940).

[21] See his *Logik der Forschung* (Vienna, 1935).

generalizations are open to revision and infected with uncertainty. And this infection is *conjured* away in the minds and hearts of those whose humanitarianism has been paralyzed by Marx's use of Hegelian historicism. In Popper's view, we need no generalizations about history; we need no futuristic identification of the present right with the coming might; we need no idolotrous assurances that human aspirations are the concern of the Universe. He argues that there is no meaning to history, that there is no objectivity (nor truth ? we ask) in any general historical statements, and that the act of empirical reasoning about matters of fact by hypothesis and deduction is but a crystallization of a point of view. We cannot aid or retard a historical purpose for there is none. We should not, as Toynbee does, speak of Marx's greatest contribution *in the eyes of history* as his stimulus to the re-thinking of Christian ethics. Popper holds that it must be solely in the opinion of rational experimental men that such estimates can meaningfully arise — here Popper finds Marx to have his great heuristic value as a man who proclaimed that the exploited should emancipate themselves. But, we can respond to Popper, why ? and how ?

The Marxist ethic has answered this first query in terms which cannot, I think, be traced solely to Hegel, either as a theory of a proletarian élite or as a dialectic of *Zeitgeiste*. And, for the second, the gauging of social strategy by historical conclusions rests on a scientific basis which, methodologically speaking, rises and falls with the natural sciences. Popper wisely stresses the role of verifiable prediction in science. He then declares that historical prediction of any sort is impossible, because the scientific is conditional and hypothetical while the historical is concrete and unconditioned. The Marxist reply would be that all applied science is, by that very pragmatic qualification, a social and historical fact, not a hypothetical analysis. Verification rests on a factual counterpart to the hypothetical generality, i.e., on a materialist prerequisite to supply truth as a relation between symbol and symbolized. That this truth is partial, that the truth relation is a three-termed one involving the symbol-user as a social individual, that the categorical fact of experimentation is inti-

mately fused with the hypothetical generalization — these will be neither wholly Hegelian factors nor yet mechanical and deterministic. They are involved in physics as well as in sociology, and they can be summarized for both sciences in a single predictive principle: [22] a conditional prediction, which is logically derived from a hypothetical general law which specifies the conditions under which prediction would be valid, becomes a historical (or concrete) prediction when the specified conditions are found with sufficient accuracy in the actual historical situation. Evidently, Marx held a set of hypotheses to be validated by concrete observations, including those on nineteenth century societies. The point of the Marxist predictive theory is that it claims to have found similarities in the flux of apparently dissimilar social facts. Moreover, since the predictive conditions are satisfied by these similarities, and these conditions are the crucial variables in his philosophy of cultural development, the use of these predictions (in the absence of more satisfactory alternatives) would be the *reasonable* usage under the circumstances. But this is operationally close to Popper's own description of natural scientific procedure. Hence, the disagreement may rest on the analysis of evidence and on the satisfactory quality of the hypothesis, but hardly on methodology. Marx has revised Hegel's method at the precise point that science requires.

However, Popper sees the difficulty as magnified by the holistic nature of the Marxist view. Thus the stricture is offered that, scientific method being itself ever partial and incomplete, the Marxist theory of history as well as the many efforts to link this theory with the wider universe of organic and cosmic evolution, must be illusory. Yet even here, it would seem that Popper has admitted the methodological principle since he thinks it quite possible to study "wholes" scientifically in the sense of investigating "certain selected properties or aspects of the thing in question, namely those that make it appear as an organized structure rather than as a 'heap'." [23] This is also the Marxist attitude to social wholes;

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[22] This phrasing is adapted from that of Paul M. Sweezy.

[23] "The Poverty of Historicism," *op. cit.*, part 2, p. 126-127.

while the choice of crucial (or, causal) variables undoubtedly differs from Popper's, it would do so on factual grounds rather than methodological ones.

But perhaps Popper has a more searching critique than these. Even if the Marxist theory is a scientifically oriented one, in method and in content, he is distressed by its applicability and its contemporary applications. Here is the genuinely provocative section of his treatise. He is concerned that theories of such sweep may be inadequately validated and roughly applied, indeed that they may, in inverse proportion to their breadth, lack the power of *specific* application. This leads, at best, to the rawest form of *ad hoc* reasoning; at worst, it would cause the abdication of reason in favor of the primitive power juggling and culture manipulation of a "closed society." It is his view that this has happened to the Marxian political movement. The careful student must weigh the fears of such dogmatic encrustation of inapplicable theory as expressed from outside the Marxist framework by Professor Popper against certain similar utterances from within that framework.[24] Both suggest a crucial need in the good society for an eternal and unrepressed criticism. One claims that it can be achieved only by the rejection of holistic theory and centralized planning. The others find the solution for Marxist inhumanities and inadequacies in the development of better Marxists. Indeed, Popper's recurring plea for action only on reasonable grounds (by which he means to imply small scale experimental planning and individualistic social theory) has a pessimistic aspect which contrasts with the optimism of his introduction to the second (American) edition: for if societal planning on the basis of available evidence is not possible now, it would seem that societal catastrophe of an unplanned nature will overtake us. It is the nonmythical recognition that plans are based on merely probable theories, in turn validated by inadequate evidence, which can characterize a modern society.

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[24] See, for example, Stalin's remarks in his interview with H. G. Wells (London: *New Statesman and Nation*, Christmas 1934), and the Zhdanov article referred to in my earlier notes on this subject (*Review of Metaphysics* 4 (December 1950).

struggling to recognize its own face and its own progeny. Popper has formulated the Marxist challenge, perhaps unintentionally, in its sharpest form: do our varied observations of social man verify the Marxist choice of productive class relation as the most explanatory concept for human history? and, if so, this fusion of the philosophy of human knowledge with the sociological study of historical societies must be followed by the factual demand: if the Marxist theory is best on the evidence, is the existing claimant to its practice a legitimate one? [25]

One of the most telling lessons for modern metaphysical and scientific philosophy, arising from Popper's obviously devoted concern for a human betterment based on honest and mythless social science, is that the philosopher must attend to man's knowledge and man's social being as Aristotle did and as Marx surely tried to do, that is, as theoretically inseparable and as practically necessary. Possibly the first problem to be solved is evident from Popper's assumption of its solution: that we can create an adequate social psychology on the basis of individual knowledge. An atomistic reductionism in social science as prescribed by Professor Popper's plea for "method-

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[25] There remains to note that Popper's aversion for "moral futurism" (that is, his opinion that Marxism leads to a combination of right as forcefully fated, and good as historically and impersonally justified) rests on two grounds. First, there is his critique of the *method* by which an oracular philosophy can compel social science to hypostatize "History"; second, his conclusion is that Marx's activism was negated by his historicism, with the result that the Marxist drowns his responsibility *for* history in a vast and closed sea of responsibilitities *to* History. For, whether it be the Spirit of History or the historic role of the Party, Popper sees a return to the metaphysical or even mythical prescientific sources of belief. Answers to these charges have been offered (e.g., M. O. Milligan, "Karl Popper's Positivism and the Science of Society," *Mod. Q.* **4** 51, 1948) that (1) universal laws, however they may have been deduced from a Universal Dialectic by Hegel, are based, *in Marxism*, on the premisses of "men... in their actual, empirically perceptible process of development under definite conditions" (Marx and Engels, *The German Ideology*, International Pub., p. 15); and (2) the moral qualities and the acts of will, which constitute the political activities of men in societies, are neither less moral nor less responsible because they are causally related to predictable factors outside them.

ological individualism" [26] is implicit in his entire condemnation of historicism, whether that of Marx or of Berdyaev. It is imperative that the rejection or assertion of methods be distinct from that of factual premisses; it is also imperative that those, who applaud Popper's urge to be rational and share his fear of the romanticism which turns into tyranny, should be just as searching in their criticism of the implications of his methodological positivism and his wary individualism.

## IV

The sources of Communism are usually given, following Lenin's own analysis, as three: English economics, French revolutionary socialism, and German philosophy. But for the Communism of the present day, we should add Russian enlightenment of the nineteenth century. Source material in English has appeared in the publication of selected philosophical writings by two of the most distinguished of these thinkers: N. A. Dobrolyubov and V. G. Belinsky.[27]

The eminent critic Herbert Read, perhaps the most important theoretical anarchist of today, has collected a slim volume of thoughts on *Existentialism, Marxism and Anarchism*,[28] devoted to the question of freedom and proceeding by a fascinating dialectic through Lukacs, Sartre and their predecessors. On the same topic, there is an important and intelligent statement of the Communist position: Rodney Hilton's pamphlet *Communism and Liberty*.[29] The Roman Catholic philosopher, Henri de Lubac, has a discerning and sympathetic review of "The New Man: the Marxist and the Christian View," [30]

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[26] He writes "our task is to analyze our sociological models... in descriptive or nominalist terms, i.e. *in terms of individuals.*"

[27] N. A. Dobrolyubov, *Selected Philosophical Essays* and V. G. Belinsky, *Selected Philosophical Essays*, each edited with an introduction by M. Yovchuk (Moscow: Foreign Languages Pub. House, 1948). See also the brief report of the address by B. Jakovenko, *Proc. Xth Int. Cong. Phil.* pp. 1213-1216 (Amsterdam: North-Holland Pub. Co., 1949).

[28] London: Freedom Press, 1949.

[29] London: Lawrence and Wishart, 1950.

[30] Originally in the French *Études*, this article was printed in English in the *Dublin Review* (Spring 1948) and in the first issue of the new American journal, *Cross Currents* (Fall, 1950).

which treats the Marxist philosophy from a distinctly non-scientific metaphysical viewpoint. A completely different approach is that of the treatise *Soviet Politics — the Dilemma of Power: the Role of Ideas in Social Change* by Barrington Moore, Jr.[31] A work of enormous labor, it is the first product of the new Russian Research Center. It might have dealt thoroughly with the philosophical framework of Soviet society in a critical manner. This it tries to do, but the manner is not a philosophical one, the evaluations are generally of a highly practical kind, the sources (on theoretical matters) are occasionally dubious, and the evaluative procedure is inadequately delineated. Nevertheless it is a volume of importance to philosophers as well as to political sociologists, for, to understand a philosophy that stresses the socially determined character of philosophy itself, one should have an understanding of that philosophy's first fruit, the contemporary Soviet society.

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[31] Cambridge: Harvard University Press, 1950.

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# GERMAN PHILOSOPHY AND THE POWER OF HISTORY

Philosophical life in Germany has gained in intensity since the war. However, recent events have had practically no influence on its subject matter. I venture to say that had Hitler and the war not existed philosophy in Germany now would be substantially as it is today. In the German mind the "world-spirit" has not stopped talking German (and a little Greek, in Heideggerian translation) and although comparatively little is written or said about him, Hegel is present everywhere. However, the world-spirit has lost some of its optimism. The dialectic of rational coziness has been somewhat shaken by such characters as described in Kafka's *Castle*, and the efforts of reconciliation on the one hand and heroic-æsthetic bravery on the other have curbed the great *hybris* of a great system. Still, what is thought in Germany to-day is strictly in tradition and might be roughly classified as philosophy of history. Also "existential" philosophy centering around Jaspers and Heidegger is essentially philosophy of history and thus in strict continuity with the problems of the 19th century schools of *Geisteswissenschaften*. The general opinion that existential thought expresses the crisis of the European situation is as wrong as it is superficial.

German philosophy as it is today can best disprove the various theories of "Historical Reason." Philosophic thought seems to go its necessary way regardless of immediate historical and social situations.

There is not such a thing as "philosophy of crisis," although there might very well be a crisis of philosophy. Philosophy of history always articulates a "crisis" in the history of thought, namely the decision toward and the initiation of a new phase of thought. This has been recognized by Alois Dempf in his *Selbstkritik der Philosophie* (2) [1] where he tries to prove that all phases of the history of philosophy (he counts 13 phases) started with a philosophy of history. Backward

[1] Numbers in parentheses refer to Bibliography at end of article.

prophecy is a characteristic of the reflection upon *Weltgeschichte* and historicity as such. Also it is usually highly apologetic and — what is most significant — it is programmatic.

It offers a program as to what man is going to think, that is, what he is going to be — and in a more radical modern version — whether he is going to be at all. Nietzsche carried historicism to its last consequence in proclaiming the coming of the "new philosophers." His influence on recent thought is growing. Heidegger's latest book *Holzwege* (6) contains an essay on "Nietzsche's word: God is dead," which is a decisive step towards the true understanding of a thinker who has been consistently misinterpreted for half a century. Heidegger's understanding of Nietzsche reveals his own position. Philosophy of history is now at a point where it tries to overcome its most powerful myth, the myth of the Power of History. Heidegger tries to do that in form of a fundamental ontology. Jaspers also, at the end of his book on philosophy of history (7) suggests that history can be surmounted. The unity of history, says Jaspers, is grasped by existence in its breakthrough to the "eternal present."

Gerhard Krüger's essay "Martin Heidegger und der Humanismus" (8) is one of the best introductions into Hegelian thought in modern Germany. Krüger maintains that Heidegger's efforts to think from the side of Being itself, and not from the side of man, as the metaphysical center, have failed. He tries to unmask Heidegger's Being in saying that it actually is nothing but the Power of History which, in order to be, must be incarnate in him who *thinks* it. Thus Krüger tries to place Heidegger in the unbroken continuity of Hegel's incarnate world-spirit whose efforts to rid itself from incarnation are frustrated. Krüger sees no way out but the metaphysical acceptance of a highest being in the platonic-theological tradition.

In three other essays Krüger joins the general efforts to defeat the myth of the Power of History by advocating the return to "tradition." The Age of Enlightenment, Krüger says, conceived itself as the absolute achievement of history and was counteracted by Romanticism which dared to give credit also to prior, allegedly "dark" ages of the Spirit. The

result was historicism, which made Reason historical and led to 19th century Nihilism and modern existentialism with its overall claim for the absolute freedom of man who creates his world and thereby world-history. But man is not so free as he thinks he is, says Krüger. There is no history without a tradition. For Krüger tradition is the rock to which drowning mankind should cling. We would have no historical change if there were no constant being (tradition) with respect to which the change could take place. He speaks of an "arche-tradition" (*Urtradition*) which he does not specify but which, reminding one of Herder's speculations, can be understood as the original harmony in man's relation to God and World. This *Urtradition* was followed by Myth which replaced God by other beings. The predominance of tradition over history, however, was first broken by the Greek Enlightenment, though we still have enough tradition left to enable us to speak of a continuity of historical events. Krüger goes so far to say that all history is basically history of religion. He repeatedly emphasizes that Nietzsche's thinking ended in insanity because he wanted to dictate the meaning to historical process, which, taken by itself, is really Nothing. In short, man cannot bear the consciousness of absolute freedom, but calls for a dictator in the spiritual realm, be it a Superman or a Church. The truly humanistic solution, however, is found in tradition — a mediation between classic "direction" and Christian Faith.

Existentialism in its pagan as well as in its Christian version raised a controversy about humanism. Heidegger in his *Letter on Humanism* discards traditional humanism as being based upon Platonic metaphysics and proposes a new humanism which conceives man as the "shepherd of Being." Jaspers in his essay "On the Conditions and Possibilities of a New Humanism" (7) shows a kind of trans-christian attitude. He can see a continuation of occidental humanistic tradition with possible future Indian and Chinese ingredients. He opposes an unconditional surrender to a positive religion of revelatory character. Man's relationship of the "Transzendenz" does not necessarily need the help of a church. True humanism is philosophy as *paideia*. It can lead man out of the Cave but the last step must be taken by himself.

These tendencies in the direction of humanism found a concrete expression in the foundation of the Leibniz-Kolleg of the University of Tübingen, which submits 50 to 60 students to a "studium generale" for one year before specialization. The institute's main objective is to further the neglected humanistic tradition and to furnish the students with material knowledge of classical subjects. The year's report of the Leibniz-Kolleg says that modern youth shows a tendency to escape from well-founded material knowledge into the realms of basic structures. The curriculum offers Latin, Greek and mathematics as well as general lectures in the sciences, in history, and in art. The stepdaughter of the curriculum is psychology; there is a general decrease of interest in it. On the other hand there are projects for the establishment of a German Society for Parapsychology (Filser-Verlag, München-Pasing). The project is favored by leading men in philosophy, science, medicine and psychology.

Among the voices raised in the discussion of humanism Heinrich Weinstock's lectures on *Real Humanism* (10) and Theodor Haecker's book *Creator and Creation* (4) are significant. Weinstock sees in the return of the Tragic, which does away with the *hybris* of subjectivism, a truly humanistic element. He sees a close relation between Humanism and socialism, Plato and Marx. This has bearing on Haecker's problem as to whether or not there is a genuine tragedy for a Christian and if so what its significance is.

A journal which opposes the current feeble attempts at a new Christian or trans-Christian humanism is *Stimmen der Zeit*. It publishes discussions like that of E. M. Lüders' "On Dealing with Pagans." Paganism caused by protestant liberalism and sociologism is said to be reaching in the dark for a Christian surrogate for humanism and æstheticism. We send missionaries to China and India, Lüders says, but we do not send them to pagan Europe. Obviously the "Voices of the Time" cannot afford to be subtle in their attempt to shout down the voices of the 19th century giants proclaiming that "God is dead."

The problem of history and humanism is closely related to the anthropological question and last but not least to the

concern for politics. Paul Häberlin's essay "Anthropology and Ontology" (3) is a critical contribution in rather sharp terms. In Häberlin's opinion the anthropological movement was started in the wrong direction. The main offender was Max Scheler. There is no such thing as empirical anthropology, says Häberlin. The truth of man's being cannot be known empirically. Scheler's concept of spirit as essential to man is ontologically devalued, because genuine power is denied to it and must be supplied by "Life." Also Heidegger's attempt to give an understanding of Being in man has failed. Heidegger's fundamental ontology in *Sein und Zeit* is nothing but a descriptive anthropology or, as Häberlin puts it, a "fundamental psychology". Ludwig Binswanger in his *Phenomenological Anthropology* (1) is said to make a similar error. And Jaspers is thought to slip into the empirical realm when he claims that the self-contradiction of consciousness is an essential trait of man. Häberlin asks for a "positive ontology" as alone providing a proper foundation of anthropology. Though his arguments are interesting it seems to me that his own suggestions involve a slip into the "empirical" no less disastrous than those of his phenomenological opponents; I think, too, that he has misunderstood Heidegger's views in *Sein und Zeit*.

The claim for a "positive ontology" finds another startling expression in Gerhard Haeuptner's essay *Über das Zeitenfernrohr* (5) (On the Time-telescope). It seems as if the World-spirit may progress — even in German — but not without further reservations. History has to be forced into an inexorable ontological frame. True freedom from historicity is *amor fati*. Reason illuminates fate, according to Haeuptner, but reason is not only *ratio* but also the dawn of divination which gives birth to history. History is spiral, time fulfills itself in spiral circles: *annullus æternitatis*. Repetition and progress contain the time experience of mythic-classical and Christian-modern thought. Time is the symbol of Being (the circle) and God is the infinite consciousness who envisages Being.

The political implications of history and humanism are best formulated in Theodor Litt's ardent appeal "Das Geistesleben und der Staat" (9). He accuses the intellectual world of

Europe of escapism from politics, arguing that the escape from politics, as "dirty business," — a prevalent view, especially among the German youth, — is an abnegation of civilized life. The spirit, he says, is actual only in its efforts at self-liberation, in the high-tension between State and Freedom.

Times of happiness are empty pages in world-history, said Hegel. "Kulturpolitik" is necessary as long as there is a disintegration between the form of life and cultural values. However, "Kulturpolitik," in order not to lead to the abuse of culture by the State, must be in the hands of those who unite worldly power and spirit. As long as our people despise the State, it will be in the hands of barbarians. Litt refers to Wilhelm von Humboldt when he advocates a "Kulturpolitik" : true humanism includes life in the State. The tension between the universal and the individual is the basic element of culture. The control of this tension, however, the "how" of history, is to be in the hands of responsible minds.

It might be said that the German *Geisteswissenschaften* are united in the effort to establish a universal form of thought and life which, on the one hand, is rooted in an ultimate ontological structure, in an *Urtradition* perhaps, and on the other hand tries to find its adequate concretion in a *Kulturstaat*. Little interest in shown in process philosophy as such. History is seen as a central problem; we are not to surrender to its power but rather are to force it into a single universal form of civilized existence.

BIBLIOGRAPHY

1. Binswanger, Ludwig : *Zur phaenomenologischen Anthropologie*. A. Francke AG Verlag, Bern 1947.
2. Dempf, Alois : *Selbstkritik der Philosophie*. Herder Verlag, Wien 1947.
3. Häberlin, Paul : "Anthropologie und Ontologie," *Zeitschrift fuer philosophische Forschung* IV, 1 1949.
4. Haecker, Theodor : *Schöpfer und Schöpfung*, 2.Aufl., Hegner Bucherei Koesel, Munchen 1949.
5. Haeuptner, Gerhard : "Über das Zeitenfernrohr," *Zeitschrift für philosophische Forschung*, IV, 4 1950.
6. Heidegger, Martin : *Holzwege*. Verlag Klostermann, Frankfurt/Main, 1950.
7. Jaspers, Karl : "Über Bedingungen und Möglichkeiten eines neuen Humanismus," *Die Wandlung* 1949.

— *Vom Ursprung und Ziel der Geschichte.* München, Piper
— Verlag 1949.

8. Krüger, Gerhard: "Martin Heidegger und der Humanismus," *Theologische Rundschau* 1950/2.
— *Geschichte und Tradition.* Kreuz-Verlag, Stuttgart 1949.
— *Die Geschichte im Denken der Gegenwart.* Rainer Wunderlich Verlag, Tuebingen 1949.
— *Das Leibniz-Kolleg der Universität Tübing* (Jahresbericht) Tübingen 1949.

9. Litt, Theodor: "Das Geistesleben und der Staat," *Archiv für Rechts- und Sozialphilosophie.* A. Francke Verlag, Bern 1950.
— *Geschichte und Verantwortung.* Dietrich'sche Verlagsbuchhandlung, Wiesbaden 1947.

10. Weinstock, Heinrich: *Realer Humanismus.* Westdeutscher Verlag, 1949.

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*New Haven, Conn.*

## CORRIGENDA

The following typographical errors have been noted in the article "Relativity and the Atomicity of Becoming," by Adolf Grünbaum, which appeared in the December 1950 issue, Vol. IV, No. 2, pp. 143-86:

P. 145, l. 26: For "nuum. James writes" read "nuum, James writes".

P. 147, l. 33: For "There conclusions" read "These conclusions".

P. 171, l. 19: For "p. 13" read "n. 13".

P. 173, n. 67, l. 4: For "*Philosophine*" read "*Philosophie*".

P. 178, n. 77, l. 1: For "p. VEC" read "p. 153".

P. 184, l. 10: For "coordinality" read "cardinality".

P. 184, l. 9: After "of" insert "a set of positions can constitute motion, if the occupation of"

P. 185, l. 30: For "these awareness" read "sense awareness".

## *Books received*

(Listing does not preclude a subsequent review)

Alexander Carl Astwood: *Beauty and the Universe.* A Book of Poems. Boston: Bruce Humphries, Inc., 1950. 72 pp. $2.75.

Monroe Beardsley: *Thinking Straight.* A Guide for Readers and Writers. New York: Prentice-Hall, Inc., 1950. 278 pp. $3.00.

Henri Bergson: *Time and Free Will.* An Essay on the Immediate Data of Consciousness. Authorized translation by F. L. Pogson. New York: The Macmillan Co., 1950. (Reprint) 252 pp. $2.75.

*Philosophical Analysis.* A Collection of Essays edited by Max Black. Ithaca, New York: Cornell University Press, 1950. 429 pp. $5.00.

*Bibliographische Einführung in das Studium der Philosophie.* Edited by I. M. Bochenski. Vol. 12: Platon, by Olof Gigon, 30 pp. Vol. 13-14: Thomas Von Aquin, by Paul Wyser, O.P., 78 pp. Vol. 17: Philosophie des Mittelalters, by Dr. Fernand Van Steenberghen, 52 pp. Vol. 18: Patristische Philosophie, by Othmar Parler, 44 pp. Vol. 19: Jüdische Philosophie, by Georgas Vajda, 40 pp. Vol. 20-21: Buddhistische Philosophie, by Dr. C. Regamey, 86 pp. Bern: A Francke Verlag, 1950.

Ben Zion Bokser: *The Legacy of Maimonides.* New York: Philosophical Library, 1950. 128 pp. $3.75.

Bernard Bolzano: *Paradoxes of the Infinite.* Translated by Dr. Fr. Prihonsky, with an introduction by Donald A. Steele, S.J. New Haven: Yale University Press, 1950. 189 pp. $3.75.

Baker Brownell: *The Human Community.* Its Philosophy and Practice for a Time of Crisis. New York: Harper & Brothers Publishers, 1950. 305 pp. $4.00.

Emil Brunner: *The Christian Doctrine of God. Dogmatics, Vol. I.* Translated by Olive Wyon. London: Lutterworth Press, 1949. 361 pp. 21s.

Kenneth Burke: *A Rhetoric of Motives.* New York: Prentice-Hall, Inc., 1950. 340 pp. $5.00.

Marjorie Burke: *Origin of History as Metaphysic.* New York: Philosophical Library, 1950. 61 pp. $2.75.

Rudolf Carnap: *Testability and Meaning.* New Haven: Graduate Philosophy Club, Yale University, 1950. 98 pp. $1.25.

André Cresson: *Le Mécanisme de L'Esprit.* Paris: Librairie Armand Colin, 1950. 217 pp. 180fr.

Marcel Drouin: *La Sagesse de Gœthe.* Preface by André Gide. Paris: Librairie Gallimard, 1949. 232 pp.

William P. Dunn: *Sir Thomas Browne.* Minneapolis: University of Minnesota Press, 1950. 182 pp. $3.00.

*A History of Philosophical Systems.* Edited by Vergilius Ferm. New York: Philosophical Library, 1950. 642 pp. $6.00.

Thomas A. Goudge: *The Thought of C. S. Peirce.* Toronto: University of Toronto Press, 1950. 360 pp. $5.50.

David Grene: *Man in his Pride.* A Study in the Political Philosophy of Thucydides and Plato. Chicago: The University of Chicago Press, 1950. 231 pp. $4.00.

Nicolai Hartmann: *Neue Wege der Ontologie.* 3d edition. Stuttgart: W. Kohlhammer Verlag, 1949. 115 pp. DM 5.60.

Rodney Hilton: *Communism and Liberty.* London: Lawrence & Wishart, Ltd., 1950. 32 pp. 1s. 3d.

Albert Hyma: *The Brethren of the Common Life.* Grand Rapids, Michigan: Wm. B. Eerdmans Publishing Co., 1950. 222 pp. $3.50.

Nathan Isaacs: *The Foundations of Common Sense.* New York: Roy Publishers, 1950. 208 pp. $3.50.

George B. Jeffery: *The Unity of Knowledge.* Reflections on the Universities of Cambridge and London. New York: Cambridge University Press, 1950. 71 pp. $1.00.

C. E. M. Joad: *A Critique of Logical Positivism.* Chicago: The University of Chicago Press, 1950. 154 pp. $2.75.

Walter A. Kaufmann: *Nietzsche: Philosopher, Psychologist, Antichrist.* Princeton: Princeton University Press, 1950. 409 pp. $6.00.

Sven Krohn: *Der Logische Empirismus, Eine Kritische Untersuchung.* Series B, Vol. XXXI, Annales Universitatis Turkuensis. Turku, Finland, 1949. 276 pp.

Harold D. Lasswell and Abraham Kaplan: *Power and Society.* A Framework for Political Inquiry. New Haven: Yale University Press, 1950. 295 pp. $4.00.

*G. W. Leibniz: Textes Inédits D'Après les Manuscrits de la Bibliothèque Provinciale de Hanovre.* Edited by Gaston Grua. Paris: Presses Universitaires de France, 1948. 936 pp. Tome I: 600 fr. Tome II: 600 fr.

*The Code of Maimonides. Book Nine: The Book of Offerings.* Translated by Herbert Dauby. New Haven: Yale University Press, 1950. 236 pp. $3.50.

Howard C. McElroy: *Modern Philosophers — Western Thought Since Kant.* New York: Russell F. Moore Company, 1950. 268 pp. $4.00.

*John Stuart Mill's Philosophy of Scientific Method.* Edited, with an introduction by Ernest Nagel. New York: The Hafner Library of Classics, Hafner Publishing Co., 1950. 461 pp. $2.50 paper, $4.50 cloth.

Robert Morency, S.J.: *L'Union de Grâce selon Saint Thomas.* Montreal: Les Editions de L'Immaculée-Conception, 1950. (Studia Collegii Maximi) 187 pp. $3.00.

William S. Morgan: *The Philosophy of Religion.* New York: Philosophical Library, 1950. 413 pp. $6.00.

Gilbert Murray: *Stoic, Christian and Humanist.* Boston: The Beacon Press, 1950. 189 pp. $2.00.

Brij Nath: *The Nature of Reality.* Delhi, India: Privately printed. 16 pp.

C. A. Richardson: *Knowledge, Reality and Life.* London: George G. Harrap & Co., Ltd., 1950. 349 pp. 15s.

J. E. Salomaa: *Philosophie der Geschichte.* Series B, Vol. XXXV, Annales Universitatis Turkuensis. Turku, Finland, 1950. 203 pp.

Dorothea Waley Singer: *Giordano Bruno: His Life and Thought.* With annotated translation of his work "On the Infinite Universe and Worlds." New York: Henry Schuman, Inc., 1950. 389 pp. $4.00.

Ram Pratap Singh: *The Vedānta of Sankara.* Vol. I. Jaipur: Bharat Publishing House, 1950. 426 pp. Rs. 10.

Edmund W. Sinnott: *Cell and Psyche: The Biology of Purpose.* Chapel Hill: The University of North Carolina Press, 1950. 121 pp. $2.00.

Matthew Spinka: *Nicholas Berdyaev: Captive of Freedom.* Philadelphia: The Westminster Press, 1950. 220 pp. $3.50.

Newton P. Stallknecht and Robert S. Brumbaugh: *The Spirit of Western Philosophy.* New York: Longmans, Green and Co., 1950. 540 pp. $4.75.

Fernand Van Steenberghen: *Erkenntnislehre. Philosophia Lovaniensis.* Vol. II. Einsiedeln, Germany: Benziger Verlag, 1950. 414 pp. DM 20.50.

Eliseo Vivas: *The Moral Life and the Ethical Life.* Chicago: University of Chicago Press, 1950. 390 pp. $6.00.

Morris Weitz: *Philosophy of the Arts.* Cambridge, Mass.: Harvard University Press, 1950. 239 pp. $4.00.

Harvey Wish: *Society and Thought in Early America.* New York: Longmans, Green and Co., 1950. 612 pp. $4.75.

*The Sociology of Georg Simmel.* Translated, edited, with an introduction by Kurt Wolff. Glencoe, Illinois: The Free Press, 1950. 445 pp. $5.50.

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